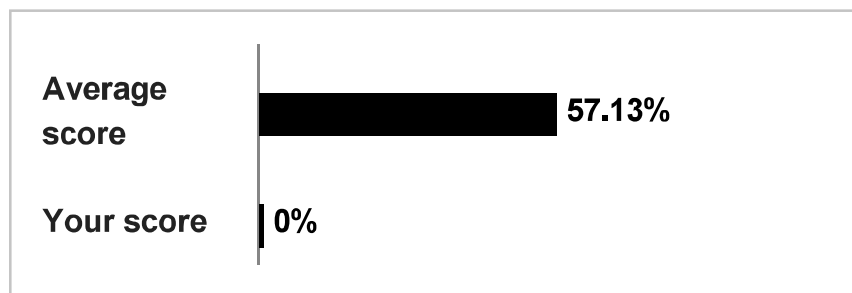


Medicine Quiz 4

Medicine Quiz 4

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

Answered Review

1. Question

1 points

A healthy 20 year old man presents with a history of recurrent episodes of severe throbbing headache. The headaches are triggered or aggravated by noise and stress and last for several hours. The pain is frequently preceded by visual disturbances, such as luminous stars or zigzags of light, and accompanied by nausea and vomiting. His father experienced a similar form of headache. The patient has found no relief with aspirin and ibuprofen. Which of the following is the most appropriate drug treatment during the acute attacks?

1. ☐ Acetaminophen
2. ☐ Calcium-channel antagonists
3. ☐ Carbamazepine
4. ☒ Ergotamine ✓
5. ☐ Prednisone

INCORRECT ✗

The correct answer is 4.

The clinical picture is virtually pathognomonic of migraine, especially considering the premonitory visual symptoms (the aura), the throbbing quality of the pain, and the positive family history. However, migraine does not always present classically. A common form of migraine may be more frequent, with diffuse (not unilateral) throbbing pain of moderate intensity, which is not preceded by visual disturbances or associated with nausea. Acute treatment is based on the administration of anti migraine drugs at the onset of symptoms. Effective drugs include ergotamine tartrate or similar compounds, and sumatriptan. Prophylactic treatment is aimed at decreasing the frequency of attacks. Calcium-channel blockers (**Choice 2**), for example, have been used for prophylaxis.

(**Choice 1**) is very unlikely to provide relief in classic migraine, especially if aspirin and ibuprofen have already failed to do so.

(**Choice 3**) has been found particularly helpful in the treatment of trigeminal neuralgia (tic douloureux), but not in migraine.


(**Choice 5**) should be used to treat patients manifesting signs and symptoms strongly suggestive of giant cell arteritis (temporal arteritis), which may lead to blindness in the absence of effective anti-inflammatory therapy. However, temporal arteritis is much more common in the elderly and would not be in the differential diagnosis in this 20 year old.

2. Question

1 points

A 55 year old man consults a physician because of weight loss and severe abdominal pain of several months' duration. The pain radiates to the mid-back and is slightly relieved when he assumes a bent forward position. On physical examination, the man appears emaciated, with mild

jaundice. The liver edge is palpable and smooth; the liver depth is not increased. The clinician suspects pancreatic cancer. Which of the following tests is the most appropriate next step in diagnosis?

1. ☒ CT scan 
2. ☐ MRI scan
3. ☐ Ultrasound
4. ☐ Arteriography
5. ☐ Endoscopic retrograde pancreatography

INCORRECT 

The correct answer is 1.

Ductal carcinoma of the pancreas is often devastating because, in roughly 90% of cases, it presents late in the clinical course, when it is no longer resectable. Therefore, the first step when this disease is suspected on clinical grounds is a CT scan, which is now recommended as the most cost-effective method of both diagnosing and staging the tumor (i.e., determining whether it is potentially resectable). If unresectable disease is detected, then definitive tissue diagnosis (for choice of chemotherapy) can be made on the basis of CT guided percutaneous needle aspiration or biopsy. If a potentially resectable lesion is identified, endoscopic ultrasound (not yet widely available) can be used to search for small metastatic lesions not visible with CT.

(Choice 2) is no more accurate than CT in detecting and staging pancreatic cancer, and is more expensive.

(Choice 3) is still frequently used, but usually is followed by CT scan. Therefore, the current thinking is to eliminate this test and go directly to CT, since the ultrasound is less sensitive.

(Choice 4) is rarely used and is primarily for determining vascular invasion and tumor resectability.

(Choice 5) is still commonly used in working up pancreatic cancer. However, this is an invasive procedure and would not be the first step in diagnosis.

3. Question

1 points

A 70 year old man presents to his physician with complaints of blurred vision in his right eye along with intermittent loss of vision, which has been occurring for the past 3 days. He describes it as a "curtain passing vertically" across the visual field. He does not have any pain, fever, headache, nausea, or vomiting. He has a history of hypertension and diabetes and is a smoker. Current

medications include captopril and twice-daily insulin. On examination, the conjunctivae are pink, the sclerae are clear, and the pupils bilaterally are 3-4 mm and reactive. Cranial nerves II-XII are intact, and there are no focal neurologic deficits. Which of the following is most likely diagnosis?

1. ☒ Amaurosis fugax ✓
2. ☐ Diabetic retinopathy
3. ☐ Retinal artery occlusion
4. ☐ Retinal detachment
5. ☐ Retinal vein occlusion

INCORRECT ✗

The correct answer is 1.

A sensation of a curtain passing across the visual field can be characteristic of either amaurosis fugax or retinal detachment (**Choice 4**). In this case, the phenomenon is transient, so amaurosis fugax is more likely than retinal detachment. Fleeting blindness is characteristically caused by retinal emboli from ipsilateral carotid disease. The visual loss is described as a curtain passing vertically across the visual field, with complete monocular visual loss lasting a few minutes. Amaurosis fugax may be due to cholesterol plaque release and is a precursor of retinal artery occlusion.

(**Choice 2**) is the most common cause of blindness in adults aged 20-65 years, but the clinical description favors a diagnosis of amaurosis fugax.

(**Choice 3**) is characterized by sudden profound visual loss. Pupils are unreactive to direct light, and there is a cherry-red spot on the fovea.

(**Choice 4**) causes progressive, unilateral, and painless blurred/loss of vision in one eye. There is often a sensation of a curtain passing down over the eyes.

(**Choice 5**) produces a sudden decrease or loss of vision; the pupils react sluggishly to light. Younger patients may present with near normal vision, whereas older patients may have significant obscuration.

4. Question

1 points

A 58 year old man with a 12-year history of type 2 diabetes mellitus comes to the physician because of an ulcer in his right foot. Physical examination reveals a 1- cm irregular ulceration over the right metatarsal head, surrounded by an area of black gangrenous skin. The patient is admitted to the hospital and undergoes amputation of the right forefoot. Which of the following measures would have been most effective in preventing this complication?

1. ☒ Appropriate instructions on self-care of the feet ✓
2. ☐ Doppler examination of the lower extremities
3. ☐ Neurophysiologic and electromyographic studies
4. ☐ Local application of platelet-derived growth factor
5. ☐ Prophylactic treatment with cholesterol-lowering agents

INCORRECT ✗

The correct answer is 1.

Diabetic patients are particularly prone to gangrene of the feet. Sensory loss due to peripheral neuropathy, small vessel disease leading to ischemia, and secondary infections are the pathogenetic factors underlying this pathology. Diabetes is the leading cause of nontraumatic amputations. In addition to strict glycemic control to prevent vascular and neurologic complications, the most effective method of prevention is self-care. The patient should receive instructions on daily foot self-examination (to look for abrasions and blisters), wearing appropriate shoes, cutting toenails straight across, and avoiding barefoot walking. **(Choice 2)** assesses vascular insufficiency. However, since the arteries may become rigid because of calcific atherosclerosis, falsely elevated blood pressure readings may be obtained with this test.

(Choice 3) are not useful to prevent foot complications. Neurophysiologic and electromyographic studies may be performed when there are symptoms of peripheral neuropathy.

(Choice 4) has some efficacy in treating non-healing ulcers refractory to debridement and antibiotic therapy.

(Choice 5) should be considered for diabetic patients with high cholesterol levels to prevent or slow atherosclerotic change.

5. Question

1 points

A 35 year old woman has had erythematous, round, scaling papules for several years. The lesions are 5-10 mm in diameter and show follicular plugging. Although the lesions are generalized in distribution, the highest numbers are on the malar prominences, bridge of the nose, scalp, and external auditory canals. Biopsy of the lesions is consistent with either discoid lupus erythematosus or systemic lupus erythematosus. Which of the following additional findings would most strongly tend to exclude discoid lupus?

1. ☐ Alopecia of the scalp

2. ☒ Anti-ds DNA ✓
3. ☐ Noncontracting scars
4. ☐ Positive antinuclear antibody test
5. ☐ Sun sensitivity

INCORRECT ✗

The correct answer is 2.

The skin manifestations of discoid lupus and systemic lupus erythematosus can be indistinguishable. Although the two conditions probably represent extremes of a spectrum, it is convenient to separate them into discoid lupus, which has none to minimal systemic effects, and systemic lupus, which often has prominent effects on other organ systems. A real clinical question arises in newly diagnosed patients, who may have either just skin manifestations or skin manifestations that are the earliest feature of what will become systemic disease. The identification of antibodies to double-stranded DNA, which are more specific than antinuclear antibodies, can exclude discoid lupus, since they are not encountered in this variant. Unfortunately, not all patients with systemic lupus develop these antibodies, so a negative result is not helpful. In these cases, the progress through time of the disease will permit its classification.

(Choice 1) Alopecia, or hair loss, of the scalp can be seen in both conditions.

(Choice 3) Noncontracting scars, usually at the centers of old lesions, can be seen in both conditions.

(Choice 4) A positive antinuclear antibody test is almost always seen in systemic lupus, but can also be seen in up to 10% of discoid patients.

(Choice 5) is seen in both conditions.

6. Question

1 points

A 25 year old man with acute myelogenous leukemia is undergoing chemotherapy. One week after his therapy, he presents with a headache, fever, and confusion. On physical examination, he has nuchal rigidity, Kernig sign, and photophobia. Laboratory results are notable for a white count of 1000 mm^3 , hematocrit of 25%, and a differential of 10% neutrophils and 5% lymphocytes. Lumbar puncture is consistent with meningitis. Which of the following is the most likely pathogen?

1. ☐ Bacteroides fragilis
2. ☐ Haemophilus influenzae
3. ☒ Pseudomonas aeruginosa ✓
4. ☐ Staphylococcus aureus

5. ☐ Toxoplasma gondii

INCORRECT ❌

The correct answer is 3.

The patient is neutropenic with an absolute neutrophil count (ANC) of 100 (1000 x 10%). He has symptoms of meningitis. By definition, a patient with an ANC less than 500 is neutropenic. Such patients are susceptible to gram-negative bacteria, such as Pseudomonas, and would be treated with IV ceftazidime.

(Choice 1) is an anaerobic agent and, along with Clostridium, is a typical pathogen in abscesses and gangrene. Infection with Bacteroides would require treatment with IV metronidazole.

(Choice 2) is the most common cause of meningitis in children. It is a gram-negative organism and would require treatment with an IV antibiotic, such as a third-generation cephalosporin.

(Choice 4) could cause meningitis after a penetrating wound and would require treatment by a IV penicillinase-resistant antibiotic, such as nafcillin or vancomycin.

(Choice 5) is a serious CNS infection in patients with HIV. Patients with Toxoplasma encephalitis will have focal or multifocal abnormalities demonstrable on CT or MRI. Common neurologic symptoms include seizures, meningoencephalitis, and headaches.

7. Question

1 points

A healthy 25 year old woman comes to the physician for a health maintenance examination. Her blood pressure is 126/82mm Hg, pulse is 75/min and regular, and respirations are 14/min. She denies any significant health problems and exercises regularly. Cardiac auscultation reveals a low-pitch grade II/III mid-diastolic murmur near the apex. It begins with a snap and ends before the first heart sound. The lungs are clear to auscultation. An ECG shows no abnormalities. Which of the following is the most appropriate next step in diagnosis?

1. ☐ Antistreptolysin O titers
2. ☐ Doppler ultrasound
3. ☒ Echocardiography ✔
4. ☐ Radionuclide angiography
5. ☐ Cardiac catheterization

INCORRECT ❌

The correct answer is 3.

The clinical presentation is consistent with mitral stenosis, with its typical opening snap followed by a diastolic “rumbling” murmur. Echocardiography is the technique of choice to evaluate mitral valve abnormalities; it can confirm an auscultatory diagnosis of mitral stenosis.

(Choice 1) Rheumatic fever continues to be one of the most frequent causes of mitral valve stenosis. Rheumatic fever is usually a sequela of pharyngitis due to group A β -hemolytic streptococci. Elevated antistreptolysin O titers are used to confirm recent streptococcal infection but would have no value in the assessment of long-term complications of rheumatic heart disease.

(Choice 2) Doppler ultrasound can give quantitative estimates of transvalvular gradients and mitral valve area, but this is usually performed after echocardiography.

(Choice 4) Radionuclide angiography is mainly used to assess left and right ventricular ejection fraction. This technique also allows the study of segmental wall motion, and can be used to estimate valvular regurgitation and measure pulmonary-to-systemic flow ratio in left-to-right shunts. It is not commonly used in the diagnosis of mitral valve disease.

(Choice 5) Most of the information needed in cases of mitral stenosis can be obtained by clinical and usually echocardiographic studies. Thus, cardiac catheterization is not necessary, unless surgery is being considered and additional information is necessary.

8. Question

1 points

A 30 year old man presents to the emergency department with severe headache, visual changes, and palpitations. His temperature is 37.2 °C (100 °F), blood pressure is 190/130 mm Hg, pulse is 130/min, and respirations are 17/min. The remainder of the physical examination is unremarkable except for clamminess of the hands and increased sweating on the face. The patient's hypertension is treated. A 24-hour urine specimen demonstrates elevated metanephrine, vanillylmandelic acid (VMA), and homovanillic acid (HVA). On questioning, the patient notes that endocrine problems have been very common in his family. This patient is most likely at significantly increased risk of developing which of the following thyroid diseases?

1. ☐ Graves disease
2. ☐ Hashimoto disease
3. ☒ Medullary carcinoma 
4. ☐ Multinodular goiter
5. ☐ Papillary carcinoma

INCORRECT 

The correct answer is 3.

The patient has a pheochromocytoma, which has produced the severe hypertension with excess urinary metabolic products of epinephrine and norepinephrine demonstrated in the 24-hour urine collection. The family history of “endocrine problems” suggests the possibility of multiple endocrine neoplasia (MEN), of which medullary carcinoma of the thyroid may be a part, particularly in type IIa (Sipple syndrome) and type IIb (mucosal neuroma syndrome).

(Choices 1 & 2) Graves disease and Hashimoto disease can be associated with other autoimmune diseases, but are not associated with the MEN syndromes.

(Choice 4) can be associated with iodine deficiency.

(Choice 5) Papillary carcinoma of the thyroid can be associated with history of neck irradiation.

9. Question

1 points

A 12 year old boy presents with acute onset of morbilliform rash, fever, malaise, and oliguria. These manifestations began 1 week after starting treatment with ampicillin for streptococcal pharyngitis. His temperature is 38.8 C (102 °F), blood pressure is 115/76mm Hg, pulse is 95/min, and respirations are 16/min. Urinalysis shows microhematuria, leukocyturia with numerous eosinophils, and occasional white blood cell casts. Proteinuria is absent. Blood studies show elevated antistreptolysin titers and moderate eosinophilia. BUN is 42 mg/dL, and serum creatinine is 2.5 mg/dL. Which of the following is the most likely diagnosis?

1. ☒ Acute interstitial nephritis ✓
2. ☐ Acute pyelonephritis
3. ☐ Acute tubular necrosis
4. ☐ Henoch-Schonlein purpura
5. ☐ Post-streptococcal glomerulonephritis

INCORRECT ✗

The correct answer is 1.

Acute interstitial nephritis is probably the second most common cause of intrinsic renal failure (after acute tubular necrosis). The most frequent causative factors are drugs, including penicillins (especially methicillin), cephalosporins, sulfonamides, NSAIDs, rifampin, and phenytoin. Coexistence of skin rash, eosinophils in the urine, and blood eosinophilia is an important diagnostic clue.

(Choice 2) often develops in the setting of some underlying urologic diseases. In children, the most common underlying factor is vesicoureteral reflux. High fever, flank pain, and abundant pyuria are the main clinical manifestations.

(Choice 3) develops as a result of severe hypoxia, prolonged prerenal azotemia, exogenous nephrotoxic agents (e.g., aminoglycosides), or endogenous substances (e.g., myoglobinuria, hemo-globin uria, or severe hyperuricemia). Granular casts, but not eosinophils, are found in the urine.

(Choice 4) is due to a small-vessel vasculitis secondary to IgA deposition. It manifests with some combination of purpura (due to dermal vessel involvement), nephritic syndrome, abdominal pain, melena, and arthralgia.

(Choice 5) is associated with a classic nephritic syndrome, which manifests with pedal and periorbital edema, hypertension, hematuria, and mild proteinuria. Red blood cell casts are seen in the urine.

10. Question

1 points

An 18 year old man presents with pain in his left knee and right ankle. There is no history of trauma. The young man states that he has not felt well since recovering from a 2-week diarrheal illness 1 month ago. On physical examination, his temperature is 38.1 °C (100.6 °F), blood pressure is 100/70mm Hg, pulse is 76/min, and respirations are 16/min. He has bilateral conjunctivitis. His right ankle and left knee are swollen, erythematous, warm, and tender. There is a small effusion present in the knee. His right Achilles tendon is also erythematous and tender. Synovial fluid from his knee shows a white blood cell count of 10,000/mm³ with 80% neutrophils. No organisms are seen on Gram stain. Which of the following is the most likely diagnosis?

1. ☐ Crohn disease
2. ☐ Felty syndrome
3. ☐ Gout
4. ☐ Juvenile rheumatoid arthritis
5. ☒ Reiter syndrome ✓
6. ☐ Septic arthritis

INCORRECT ✗

The correct answer is 5.

This young man has developed asymmetric, noninfectious polyarthritis, conjunctivitis, and Achilles tendinitis following a self-limited diarrheal episode. This is called Reiter syndrome, or reactive arthritis. The other features of this syndrome are urethritis, circinate balanitis, keratoderma blennorrhagica, anterior uveitis, and an association with HLA-B27.

(Choice 1) Abdominal pain and chronic diarrhea are the main features of Crohn disease. Intestinal malabsorption and significant weight loss may be present. Arthritis is seen in some patients with Crohn disease and affects lumbosacral and sacroiliac joints, as well as

peripheral joints. However, Crohn disease is usually not characterized by an acute, self-limited diarrheal episode.

(Choice 2) consists of chronic rheumatoid arthritis, splenomegaly, neutropenia, and, on occasion, anemia and thrombocytopenia. It is most common in individuals with long-standing disease. These patients frequently have high titers of rheumatoid factor, subcutaneous nodules, and other manifestations of systemic rheumatoid disease.

(Choice 3) In gout, the initial attack typically affects only one joint, most commonly the first metatarsal joint. Monosodium urate crystals in the joint fluid, which appear long, needle shaped, and negatively birefringent, are diagnostic. The synovial fluid leukocyte count tends to be higher, in the 25,000 to 50,000/mm³ range.

(Choice 4) Juvenile rheumatoid arthritis is a particular arthritis involving mainly the knees and hips. Achilles tendinitis is not a feature of this disease.

(Choice 6) Septic arthritis should always be considered with sudden-onset inflammatory arthritis in one or more joints. It can lead to rapid destruction if it is untreated. Septic arthritis is classified as gonococcal or nongonococcal, and it is presumptively diagnosed when synovial fluid has a white blood cell count over 50,000/mm³ and over 90% neutrophils. Organisms are often found on Gram stain of synovial fluid.

11. Question

1 points

A 25 year old schizophrenic patient presents with painful oral ulcers. He was started on chlorpromazine treatment 3 months ago. He is currently afebrile, and there is no evidence of significant somatic disease on physical examination. Blood analyses show:

Hematocrit: 45%

Platelet count: 320,000/mm³

Leukocyte count: 400/mm³


Differential

Lymphocytes: 85%

Monocytes: 10%

Neutrophils: 5%

Morphology of red and white blood cells is normal on peripheral blood smears. Which of the following is the most appropriate next step in management?

1. ☒ Discontinue current pharmacologic treatment 
2. ☐ Treat stomatitis by topical corticosteroids
3. ☐ Treat with myeloid growth factors (G-CSF and GM-CSF)
4. ☐ Admit patient for broad spectrum antibiotic treatment
5. ☐ Perform bone marrow aspirate examination

INCORRECT ❌

The correct answer is 1.

This patient presents with clinical manifestations consistent with drug-induced neutropenia. Neutropenia is defined as a blood cell count lower than $1500/\text{mm}^3$. Neutropenic patients are susceptible to bacterial and fungal infections. Drugs that may cause neutropenia include chlorpromazine, sulfonamides, procainamide, methimazole, propylthiouracil, penicillins, cephalosporins, and multiple chemotherapeutic agents. Clinical severity may vary considerably in relation to the degree of neutropenia. Sore throat and oral ulcers (stomatitis) are the mildest signs, but life threatening infections may be the presenting manifestations. If signs of infection are absent, the patient may be followed on an outpatient basis, and, of course, suspected drugs should be immediately discontinued.

(Choice 2) Topical corticosteroid therapy for stomatitis is not useful in this case. It is occasionally beneficial in aphthous ulcers, i.e., small but painful erosions of the buccal mucosa. Oral ulcers associated with neutropenia will resolve as soon as leukocyte counts return to normal levels.

(Choice 3) may be used to hasten recovery of bone marrow in patients with neutropenia secondary to chemotherapy.

(Choice 4) Admitting the patient for broad-spectrum antibiotic treatment is not recommended unless there is fever or other signs of infection. Hospitalization may indeed be more risky than useful to neutropenic patients, since it exposes them to nosocomial infections.

(Choice 5) Examination of bone marrow aspirate is not useful in this case, since both the condition and its underlying cause (i.e., neutropenia due to chlorpromazine toxicity) are relatively obvious, and are reversible with discontinuation of the drug.

12. Question

1 points

A 60 year old man presents with shortness of breath and dull left-sided chest pain. Examination reveals decreased breath sounds on the left. A chest x-ray film is consistent with a large left-sided pleural effusion, for which the patient undergoes thoracentesis. The fluid is slightly turbid with a pH of 7.2, a white count of $60,000/\text{mm}^3$, an RBC count of $15,000/\text{mm}^3$, an LDH of 400 IU/L, and a serum LDH of 500 IU/L (normal 50-150 IU/L). A repeat chest x-ray film reveals a pneumonia in the right middle lobe. A pleural fluid Gram stain shows multiple gram-positive diplococci. Which of the following is the most appropriate next step in management?

1. ☐ Ampicillin
2. ☐ Diuresis
3. ☐ Pleural biopsy
4. ☐ Pleurodesis
5. ☒ Chest tube insertion ✓

INCORRECT ✖

The correct answer is 5.

Pleural effusions may be transudative or exudative. This effusion is exudative since the pleural fluid/serum LDH ratio is greater than 0.6. Causes of exudates include parapneumonic effusion, tuberculosis, pulmonary infarct, malignancy, and bacterial infection. Organisms in the fluid, a pleural fluid leukocyte count of 50,000, and a low pH constitute a complicated parapneumonic effusion. Such collections tend to loculate and form adhesions if not immediately drained with a chest tube.

(Choice 1) This infection may prove too tenacious to eradicate with antibiotic coverage alone. The risk of mortality increases with age and extent of hemodynamic compromise. This patient probably has a streptococcal infection and would need coverage with penicillin in association with chest tube placement.

(Choice 2) Diuresis would be an option if this patient had heart failure that was compromising his respiratory status, but such effusions are simple transudates.

(Choice 3) Biopsy will not be helpful in the diagnosis in this patient with an obvious parapneumonic effusion; thoracentesis must be performed, and the fluid examined. A common complication of a biopsy is pneumothorax.

(Choice 4) Pleurodesis might be an option if this were a malignancy and the patient had recurring effusions, compromising his pulmonary function. This is often achieved by injecting talc or bleomycin in the pleural space, thereby causing adhesions between the two layers of pleura and preventing future fluid collections.

13. Question

1 points

A 46 year old housewife from Connecticut presents with complaints of malaise, arthritis, and a rash on her left thigh. ELISA and Western blot confirm infection with *Borrelia burgdorferi*. A 30-day course of oral doxycycline with follow-up in 1 week is prescribed. The patient cancels the follow-up appointment and returns 3 months later complaining of facial droop, confusion, daily fevers, and tingling in her hands and feet. She states that she felt markedly better after 2 weeks on the antibiotics and therefore discontinued her medication. Which of the following is the most appropriate next step in management?

1. ☐ A 14-day course of chloramphenicol
2. ☒ A 14-day course of IV ceftriaxone ✓
3. ☐ A 28-day course of IV vancomycin
4. ☐ Prescribe a repeat 3-day course of oral doxycycline
5. ☐ Prescribe a 30-day course of oral amoxicillin

INCORRECT ❌

The correct answer is 2.

This patient now has neurologic manifestations of Lyme disease. Approximately 15% of patients at some point develop frank neurologic abnormalities, including meningitis, encephalitis, chorea, cranial neuritis (including bilateral facial palsy), motor and sensory radiculoneuritis, or mononeuritis multiplex. The usual pattern is fluctuating meningoencephalitis with superimposed cranial nerve (particularly facial) palsy and peripheral radiculoneuropathy, but Bell palsy may occur alone. The best treatment is admission to the hospital for N ceftriaxone (2 g daily for 10-21 days). An alternative is N penicillin G (20 million units a day for 10-20 days).

(Choices 1 & 3) Chloramphenicol and vancomycin are not appropriate drugs for the treatment of Lyme disease.

(Choices 4 & 5) Oral antibiotic therapy is not appropriate for treating advanced neurologic Lyme disease.

14. Question

1 points

A 65 year old man comes to the physician because of an increasingly severe tremor that affects the right hand. The tremor is particularly marked at rest and disappears when the limb is in movement. The man's speech is soft but not monotonous. There is increased resistance when the arms or neck are passively flexed. Sensation and muscle strength appear intact. Short-term memory is preserved. The patient's blood pressure is 134/82mm Hg, temperature is 37 °C (98.6 °F), pulse is 70/min, and respirations are 10/min. The patient has a history of a previous episode of narrow-angle glaucoma. Which of the following drugs should be avoided in the treatment of his neurologic condition?

1. ☐ Amantadine
2. ☒ Benztropine ✓
3. ☐ Bromocriptine
4. ☐ Levodopa
5. ☐ Selegiline

INCORRECT ❌

The correct answer is 2.

The clinical picture is consistent with Parkinson disease at a relatively early stage. Resting tremor may be unilateral at first. Anticholinergic drugs, such as benztropine, are frequently

used initially and are effective in alleviating tremor and rigidity. The key to the correct answer is the fact that the patient's history includes narrow-angle glaucoma. Use of anticholinergic drugs may lead to an acute increase of intraocular pressure in predisposed individuals and precipitation of narrow-angle glaucoma. Other contraindications to the use of anticholinergics include prostatic hyperplasia (or symptoms of urinary retention) and gastrointestinal obstruction (or severe constipation).

(Choice 1) is also used for mild Parkinsonism, although its mechanism of action is unclear. Depression, postural hypotension, and cardiac arrhythmias are the most serious adverse effects.

(Choice 3) is one of the dopamine agonists used for Parkinson disease. This drug was used before the introduction of levodopa; currently, it is sometimes used in association with low doses of levodopa-carbidopa. Bromocriptine is contraindicated in patients with neuropsychiatric disturbances, recent myocardial infarction, or peptic ulcer.


(Choice 4) is the drug of choice for treatment of Parkinson disease. Nausea, vomiting, and hypotension are the most common side effects.

(Choice 5) is an inhibitor of monoamine oxidase B. It is used as an adjunctive treatment along with levodopa. Available evidence suggests that selegiline might be effective in retarding progression of the disease.

15. Question

1 points

A patient presents to a physician with severe jaundice. Physical examination reveals a nodular, enlarged liver. In addition to the generalized nodularity of the liver, the physician can feel one nodule that is much larger than the others. CT of the abdomen confirms multinodular cirrhosis and demonstrates a 7-cm mass near the lower border of the liver. CT-guided biopsy of this mass shows a malignant tumor derived from hepatic parenchymal cells. Which of the following risk factors is most strongly associated with the development of this tumor?

1. ☐ Aflatoxin exposure
2. ☐ Hemochromatosis
3. ☒ Hepatitis B virus infection 
4. ☐ Opisthorchis infection
5. ☐ Thorotrast exposure

INCORRECT 

The correct answer is 3.

The tumor is a hepatocellular carcinoma, which usually develops in the setting of cirrhosis because of a variety of damaging agents. By far the most commonly implicated etiologic

factor worldwide is infection with hepatitis B or C. Other important risk factors include alcohol abuse, hemochromatosis, and aflatoxin exposure.

(Choice 1) Aflatoxin is a fungal toxin found in contaminated bean products, including soy beans and soy products (e.g., soy sauce).

(Choice 2) Hemochromatosis is a disease of disordered iron metabolism, which particularly damages liver, pancreas, heart, and skin.


(Choice 4) Opisthorchis is a liver fluke that infects the biliary tract and predisposes for cholangiocarcinoma, not hepatocellular carcinoma.

(Choice 5) Thorotrast is a radiologic contrast medium that is no longer used because it predisposed for cholangiocarcinoma, not hepatocellular carcinoma.

16. Question

1 points

A 37 year old florist comes to the employee health clinic for a routine evaluation. He is healthy and without complaints. Five units of tuberculin protein (PPD) is injected intradermally. He returns to the clinic 48-72 hours later. Which of the following would indicate a positive reaction in this patient?

1. ☐ 5 mm of erythema and 5 mm induration
2. ☐ 10 mm of erythema and 5 mm induration
3. ☐ 15 mm of erythema and 5 mm induration
4. ☒ 15 mm of erythema and 15 mm induration 
5. ☐ 20 mm of erythema and 10 mm induration

INCORRECT 

The correct answer is 4.

The tuberculin skin test is usually applied to the forearm. Reaction should be read measuring the transverse diameter of induration as detected by gentle palpation at 48-72 hours.

Reaction of > 15 mm is considered a positive test in patients from a low-risk population. The degree of erythema is unimportant.

(Choices 1,2 & 3) An induration of 5 mm is considered positive in patients at high risk to be infected, i.e., immunocompromised patients, and in household contacts of tuberculosis patients.

(Choice 5) An area of induration measuring 10 mm is considered positive only in patients from population groups at elevated risk of tuberculosis, i.e., health care workers.

17. Question

1 points

A 18 year old woman comes to medical attention because of fever and a red papule on her left forearm, which developed 1 week after being scratched by her cat. She has had temperatures to 38.5 °C (101.3 F) and malaise for 2 days. Examination reveals enlarged and tender lymph nodes in the epitrochlear and axillary regions. Which of the following is the most likely pathogen?

1. ☒ Bartonella henselae ✓
2. ☐ Bartonella quintana
3. ☐ Calymmatobacterium granulomatis
4. ☐ Chlamydia psittaci
5. ☐ Pasteurella multocida

INCORRECT ✗**The correct answer is 1.**

This is cat-scratch disease, an acute infection due to *Bartonella henselae* that is transmitted to humans by a cat scratch or bite. A papule or an ulcer develops at the site of the scratch/bite, followed 1-2 weeks later by fever, malaise, and regional lymphadenopathy. The disease is self-limiting and does not require any treatment. Rarely, biopsies of lymph nodes are necessary to establish a diagnosis. Affected lymph nodes will exhibit a necrotizing granulomatous reaction with characteristic stellate-shape areas of necrosis. *B. henselae* causes bacillary angiomatosis in immunocompromised patients.

(Choice 2) is the etiologic agent of trench fever, which is transmitted by the human body louse.

(Choice 3) causes a sexually transmitted disease known as granuloma inguinale. A slowly enlarging, painless ulcer develops at the inoculation site, followed by granulomatous inflammation in the inguinal lymph nodes and, subsequently, scarring and adhesions.

(Choice 4) is the etiologic agent of psittacosis, transmitted by infected birds (parrots, parakeets, pigeons, and others). The disease manifests 1-2 weeks after exposure. It consists of atypical pneumonia indistinguishable from that caused by either viruses or bacteria.

(Choice 5) is part of the normal mouth flora of cats and dogs. It is the most common pathogen causing early infection secondary to cat and dog bites. This manifests within 24 hours after the bite with local swelling and pain, regional lymphadenopathy, and fever.

18. Question

1 points

A 56 year old woman with a long history of painful osteoarthritis of the hip and lower back comes to medical attention because of polyuria for 3 months. She denies any previous urinary tract infection or renal disease. Her blood pressure is 135/80 mm Hg. Urine dipstick test shows hematuria and mild proteinuria. Blood studies reveal mild microcytic anemia, hyperkalemia, and normal uric acid levels. Ultrasonography shows kidneys of normal size. Intravenous pyelography (IVP) demonstrates the presence of characteristic “ring shadow,, defects at the tips of renal papillae. Which of the following is the most likely cause of this condition?

1. ☒ Analgesic nephropathy ✓
2. ☐ Lead exposure
3. ☐ Multiple myeloma
4. ☐ Obstructive uropathy
5. ☐ Polycystic kidney disease
6. ☐ Vesicoureteral reflux

INCORRECT ✗

The correct answer is 1.

The long history of osteoarthritis should suggest chronic analgesic abuse as the underlying etiology of this renal condition, which is chronic tubulointerstitial nephritis. Analgesic nephropathy affects patients who consume significant amounts of aspirin, NSAIDs, phenacetin, or acetaminophen for at least 3 years. Clinical surveys have shown that patients often underestimate the amount of analgesics that they ingest daily. Note the main diagnostic clues of chronic tubulointerstitial nephritis: progressive polyuria because of inability of the renal tubules to concentrate urine, hyperkalemia, presence of radiologic signs of papillary necrosis (often associated with this condition), concomitant microhematuria, and mild proteinuria. Microcytic anemia may develop because of gastrointestinal blood loss secondary to the same drugs.

(Choice 2) is now a rare cause of chronic tubulointerstitial nephritis. Lead intoxication also results in impaired tubular secretion of uric acid and hyperuricemia (note normal uric acid levels in this case); consequently, “saturnine” gout may ensue. Peripheral neuropathy may also manifest, leading to wrist drop. Suspect lead intoxication in alcoholics who drink “moonshine” alcohol prepared in old automobile radiators.

(Choice 3) is associated with bone involvement that manifests with pain and pathologic fractures. The resulting monoclonal gammopathy may cause renal damage. These patients are generally the elderly and may also present with a normochromic, normocytic anemia and hypercalcemia.

(Choice 4) is another frequent cause of tubulointerstitial nephritis and papillary necrosis. It is commonly accompanied by an underlying disease, such as urolithiasis or prostatic hyperplasia. This patient does not have a history of renal disease.

(Choice 5) is an inherited renal disorder, presenting as multiple bilateral cysts that increase renal size and reduce functioning renal tissue. Patients may develop renal failure in the fourth

to sixth decade of life. Abdominal pain, hypertension, hematuria, and impaired concentrating ability of the kidneys are common findings. Multiple bilateral cysts in the renal parenchyma and enlarged kidneys are seen on ultrasound and intravenous pyelography.

(Choice 6) manifests in children and young adults with recurrent urinary tract infections. It is associated with hydronephrosis (dilatation of renal pelvis) and would not present for the first time in a 56 year old.

19. Question

1 points

An 82 year old woman is accompanied to the physician by her daughter because of repeated falls without apparent cause. The patient reports that she fell to the ground because of a sudden loss of strength in her legs without losing consciousness or feeling dizzy. She lay on the floor for a few minutes until she recovered strength and became able to stand up and walk again. She is otherwise in good health and takes alendronate for osteoporosis. Examination reveals mild resting tremor of her hands, but there is no rigidity or slowing of movements. Her blood pressure is 125/80 mm Hg, pulse is 68/min and regular, and respirations are 13/min. On auscultation, a bruit is heard over the right carotid artery. Which of the following is the most likely cause of this patient's falls?

1. ☐ Adverse drug reaction
2. ☐ Lateral medullary infarction
3. ☐ Parkinson disease
4. ☐ Postural hypotension
5. ☐ Transient ischemia in the carotid territory
6. ☒ Transient vertebrobasilar ischemia ✓

INCORRECT ✗

The correct answer is 6.

The clinical symptomatology is strongly suggestive of "drop attacks" resulting from transient ischemia in the vertebrobasilar territory. Ischemia of the pyramidal tract in the brainstem is the most probable pathogenetic mechanism. Transient ischemic attacks (TIAs), by definition, last less than 24 hours (usually less than 1 hour). TIA is often a harbinger of stroke, especially when involving the carotid circulation.

(Choice 1) must be considered as a potential etiology of frequent falls in an elderly patient, especially when hypotension is the suspected mechanism and there is a history of antihypertensive medication. The most common adverse effect of alendronate is esophagitis.

(Choice 2) follows occlusion of the vertebral or posterior inferior cerebellar artery. Its manifestations include ataxia, vertigo, nystagmus, impaired pain and temperature sensation on the ipsilateral face and contralateral body, dysphagia, and hoarseness.

(Choice 3) leads to resting tremor, rigidity, and bradykinesia. Falls due to Parkinson disease result from loss of postural reflexes, which can be assessed by the pull-test.

(Choice 4) is a frequent cause of falls in the elderly and is often the result of medication.

Typically, the patient reports a light-headed sensation on standing or getting up from bed, and the fall may be accompanied by a transiently obtunded consciousness.

(Choice 5) The carotid bruit in this case is probably secondary to atherosclerotic stenosis of the carotid artery but not to the patient's symptoms. Transient ischemia in the carotid territory manifests with motor deficits, sensory symptoms, or alterations in language expression or comprehension (aphasia).

20. Question

1 points

A 39 year old man presents to the emergency department with acute onset of shortness of breath, hemoptysis, and left-sided pleuritic chest pain. His past medical history includes medication-controlled asthma, peptic ulcer disease, and a recent onset of idiopathic nephrotic syndrome. His blood pressure is 180/100 mm Hg, pulse is 110/min, and respirations are 28/min. Cardiac and lung examinations are normal. Laboratory data are remarkable for a serum lactate dehydrogenase of 300 U/L. An ECG shows sinus tachycardia, prominent S waves in lead 1, inversions of the T wave, and a prominent Q wave in lead III. Which of the following is the most likely cause of the chest pain?

1. ☐ Aortic dissection
2. ☐ Esophageal spasm
3. ☐ Myocardial infarction
4. ☐ Pneumonia
5. ☒ Pulmonary embolism ✓
6. ☐ Variant angina

INCORRECT ✗

The correct answer is 5.

Clinical features suggestive of pulmonary embolism in this patient are pleuritic chest pain, hemoptysis, tachycardia, tachypnea, and elevated serum lactate dehydrogenase (suggestive of lung infarction). Individuals with nephrotic syndrome are at increased risk of pulmonary embolism because of an underlying hypercoagulable state. Possible mechanisms responsible for the underlying hypercoagulability include loss of anticoagulant proteins in the urine and intravascular volume depletion. The ECG findings are indicative of acute cor pulmonale, which may mimic inferior myocardial infarction (MI); however, an inferior wall MI is characterized by prominent Q waves and ST segment elevations in leads II, III, and AVF.

(Choice 1) causes severe, tearing chest pain radiating to the back. Loss or decrease of a peripheral pulse, new-onset aortic insufficiency, and pericardial tamponade are possible physical findings of aortic dissection.

(Choice 2) can cause retrosternal chest pain and is usually associated with a history of dysphagia. The pain is typically substernal and usually not pleuritic in nature. It accounts for about 10% of non-cardiac causes of chest pain.

(Choice 3) classically presents with retrosternal chest pain that may radiate to the left arm, neck, or jaw. The pain is described as a dull ache or heaviness in the chest and may be associated with dyspnea, diaphoresis, light-headedness, and nausea.


(Choice 4) may cause unilateral pleuritic chest pain if there is pleuritis or pleural effusion complicating the pneumonia. However, the patient would have fever and cough, indicating the presence of infection.

(Choice 6) presents with chest pain or pressure at rest and the classic transient elevation of the S-T segment on ECG. Reduced coronary blood flow results from transient coronary spasm. Variant angina is not associated with elevated serum LDH or Q- and T wave inversions on ECG.

21. Question

1 points

A 45 year old woman with systemic lupus erythematosus (SLE) comes to the physician for a routine checkup. Her condition has been stable for several years, and she currently is not taking any medication. Blood chemistry studies and hematologic parameters are remarkable for a blood urea nitrogen (BUN) of 23 mg/dL, a creatinine of 1.6 mg/dL, and a mild normocytic anemia. The erythrocyte sedimentation rate is 18 mm/min. Urinalysis shows microhematuria and mild proteinuria. Which of the following is the most appropriate next step in management?

1. ☐ Repeat urinalysis at next routine examination
2. ☐ Sequential serum complement and ANA studies
3. ☐ Treatment with corticosteroids
4. ☐ Treatment with cyclophosphamide
5. ☒ Renal biopsy 

INCORRECT 

The correct answer is 5.

Renal involvement is one of the most common manifestations of systemic lupus erythematosus (SLE) and a major cause of morbidity and mortality. When renal abnormalities are detected in patients with SLE, a renal biopsy must be performed. SLE may, in fact, lead to various types of morphologic changes, which can be evaluated only by biopsy

examination and have fundamental implications for choosing the most appropriate therapy. Such changes have been divided into five types. Type I and II lesions (normal and mesangial proliferative, respectively) require no treatment. Type III and IV lesions (focal segmental proliferative and diffuse proliferative, respectively) require aggressive immunosuppressive treatment. Type V lesions (membranous glomerulopathy) require immunosuppression if superimposed proliferative lesions are found.

(Choice 1) A repeat urinalysis at the next routine examination, while adequate in patients with type I and II lesions is not appropriate in SLE patients in whom the underlying glomerular changes are still unknown.

(Choice 2) Sequential serum complement and ANA studies are useful to monitor response to treatment, or to follow patients with type I and II lesions. A return to normal values of markers such as C3, C4 and dsDNA antibodies indicates remission, whereas rising levels in patients with type I and II lesions suggest the need of repeat biopsy studies.

(Choices 3 & 4) Treatment with corticosteroids represents the mainstay of therapy for SLE patients with proliferative glomerular lesions (types III and IV). If these patients do not respond to corticosteroids, cyclophosphamide is used.

22. Question

1 points

A 62 year old man presents with complaints of severe pain in his left wrist that he says is episodic and has increased in frequency over the past year. He says that he cannot move the wrist when this happens. His father had similar problems before he died of kidney problems due to diabetes. The patient is also diabetic and is taking insulin. His physical examination is normal, except for the limitation of motion of the left wrist. A CBC is normal, and serum chemistry findings are as follows:

Sodium: 139 mEq/L

Potassium: 3.9 mEq/L


Chloride: 98 mEq/L

Calcium: 9.2 mEq/L

Uric acid: 4mg/dL

Synovial fluid analysis reveals a white blood cell count of 32,000/ μ L with 60% neutrophils.

Rhomboid-shaped, positive, birefringent crystals are seen under polarized light. Which of the following is the most likely diagnosis in this patient?

1. ☐ Charcot arthropathy
2. ☐ Degenerative joint disease
3. ☐ Gout
4. ☒ Pseudogout 
5. ☐ Rheumatoid arthritis
6. ☐ Septic arthritis

INCORRECT ✖

The correct answer is 4.

The presence of rhomboidal, positively birefringent crystals in the joint aspirate is diagnostic of pseudogout. This type of crystal arthropathy usually occurs in persons older than 60 years. The crystals consist of calcium pyrophosphate and tend to deposit on the joint cartilage. Pseudogout is associated with a variety of metabolic disorders, such as diabetes, hypothyroidism, hyperparathyroidism, and hemochromatosis. Management consists of NSAID administration for acute episodes. Colchicine can be used for prophylaxis.

(Choice 1) Charcot arthropathy, which is also called neuropathic arthropathy, is a rapidly destructive arthropathy due to impaired pain perception and position sense. Repetitive injury is unnoticed and causes relatively painless destruction of the joint. Charcot arthropathy is most commonly associated with diabetic neuropathy and tabes dorsalis. The presence of crystals and an inflammatory pattern are not seen on synovial fluid examination of Charcot joints.

(Choice 2) Degenerative joint disease does not produce crystals in the joint fluid.

(Choice 3) Gout typically presents with pain in the first metatarsophalangeal joint or in the knee joint. The joint aspirate would show negatively birefringent needle shaped crystals.

(Choice 5) Rheumatoid arthritis usually presents with pain in small joints (e.g., hands and wrists), is symmetric, and is accompanied by morning stiffness greater than 1 hour in duration. It is associated with rheumatoid factor.

(Choice 6) Septic arthritis is associated with evidence of microorganisms in the joint aspirate or elsewhere in the body, and there are large numbers of neutrophils in the joint fluid.

23. Question

1 points

A 52 year old woman from Southeast Asia comes to medical attention because of slowly growing nodular lesions on her nose and auricles. Examination also reveals bilateral hypoesthesia in the upper extremities along the ulnar nerve distribution. Biopsies of the skin lesions demonstrate a florid granulomatous reaction with numerous acid-fast bacilli (AFB) within multinucleated giant cells. Cultures on blood agar and special media, however, yield no growth. Which of the following is the most likely diagnosis?

1. ☒ Lepromatous leprosy ✔
2. ☐ Lupus vulgaris
3. ☐ Mycobacterium avium-intracellulare (MAI)
4. ☐ Sarcoidosis
5. ☐ Tuberculoid leprosy

INCORRECT ✖

The correct answer is 1.

Leprosy is endemic in many parts of Africa, Asia, and South America. The patients seen in the Australia are usually immigrants from endemic regions. *Mycobacterium leprae*, the etiologic agent, cannot be cultured in artificial media. A characteristic feature of this mycobacterium is that it tends to affect cooler parts of the body, such as the nose, ears, and scrotum, and has a special tropism for peripheral nerves. In lepromatous leprosy, granulomas contain numerous acid-fast bacilli (AFB), which are easily identifiable on tissue sections. This form results from defective cellular immunity and is the most contagious. Nodular lesions in the skin and areas of anesthesia are the most characteristic manifestations. Bilateral ulnar neuropathy is highly suggestive of lepromatous leprosy. It should be treated with a triple-agent combination therapy, including dapsone, clofazimine, and rifampin, for at least 2 years.

(Choice 2) Lupus vulgaris results from reactivation tuberculosis and is most commonly associated with non-necrotizing granulomas, in which acid-fast bacilli are difficult to demonstrate by special stains.

(Choice 3) is an opportunistic infection that may cause fevers, lymphadenopathy, pneumonia, and hepato splenomegaly. It does not typically produce the skin lesions described in this patient.

(Choice 4) Sarcoidosis of the skin may mimic leprosy, lupus vulgaris (i.e., skin tuberculosis), lupus erythematosus, and other conditions. It is characterized by non-necrotizing granulomas, in which no infectious agent can be demonstrated by special stains, polymerase chain reaction (PCR) techniques, or culture. In most cases, the lungs and lymph nodes are involved. Sarcoidosis is a diagnosis “of exclusion;” to be considered only after infectious and noninfectious etiologies have been ruled out.

(Choice 5) Lepromatous leprosy differs significantly from tuberculoid leprosy, which is a milder form due to hypersensitivity to infecting bacilli. In this form, acid fast bacilli are rarely found in the dermal histiocytic collections. Tuberculoid leprosy is treated with dapsone and rifampin for 6-12 months.

24. Question

1 points

A 42 year old man presents with a chief complaint of severe, sharp chest pain that started suddenly while lifting heavy objects. The pain began in a midsternal location, then radiated to both shoulders as well as to his back. It has been constant for 18 hours but started to get worse during the past 2 hours. On physical examination, the patient is in severe distress, with a temperature of 36.9 C (98.5 F), blood pressure of 160/90mm Hg, pulse of 92/min, and respirations of 18/min. Heart sounds are normal without rubs or murmur. An ECG reveals a normal tracing. Which of the following is the most appropriate next step in diagnosis?

1. ☒ Chest x-ray film ✓
2. ☐ CT scan of chest
3. ☐ MRI
4. ☐ Ventilation-perfusion (V/Q) scan
5. ☐ Angiogram

INCORRECT 

The correct answer is 1.

Of all the possible diagnoses, the one that will kill the patient the fastest, but is surgically treatable if caught early, is aortic dissection. Aortic dissection must be ruled out before heparin can be administered. A chest x-ray film can provide important information about a possible dissection. In 90% of patients with aortic dissection, widening of the aorta will be seen on chest x-ray. A left pleural effusion is also common. The diagnosis can also be made by transesophageal echocardiography (TEE), MRI, dynamic CT scan, or catheterization. These three methods have comparable accuracy, but TEE is preferred if available because it is the fastest and does not require the patient to lay still for a long period of time. Chest x-ray is available in more centers and will give the quickest results.

25. Question

1 points

A 55 year old, homeless, alcoholic man who has recently been bingeing complains of 2 weeks of fever, malaise, productive cough, and pain on deep inspiration. He has smoked two packs of cigarettes per day for the past 30 years. A chest x-ray film reveals an infiltrate of the superior portion of the right lower lobe, with a cavity containing an air fluid level. A biopsy is likely to show which of the following?

1. ☐ Acid-fast bacilli and caseating granulomas
2. ☐ Anaplastic squamous cells with numerous mitotic figures
3. ☐ Fibrosis and needle-like ferruginous bodies
4. ☐ Gram-positive, lancet-shaped diplococci in short chains
5. ☒ Mixture of anaerobic organisms

INCORRECT 

The correct answer is 5.

This patient's signs and symptoms indicate aspiration pneumonia with resultant lung abscess. Lung abscesses in an unconscious or obtunded patient result from aspiration of infected material from the upper airway. The causative organisms are usually mixed anaerobes from oral flora. This patient's infiltrate is in the superior portion of the right lower lobe, a common site of aspiration pneumonia. Sputum is copious in lung abscesses and often malodorous. Patients have risk factors for aspiration (drugs, CNS disease, general anesthesia, coma, or excessive sedation), and many patients have periodontal infection.

(Choice 1) Acid-fast bacilli and caseating granulomas refer to pulmonary tuberculosis. Although it may be seen in homeless alcoholics, tuberculosis more often presents with a protracted, rather than an acute, illness. Additionally, cavity formation classically occurs in the upper lung lobes.

(Choice 2) Considering this patient's long history of tobacco use, a possible diagnosis is squamous cell carcinoma, which may lead to a mass with an air-fluid level that resembles a lung abscess radiographically. Additionally, some lung cancers can present with a post obstructive pneumonia with resultant lung abscess. However, lung cancer usually presents with symptoms over longer periods of time.

(Choice 3) Fibrosis and needle-like ferruginous bodies are the classic histology for asbestosis. Asbestosis results from long-term exposure to asbestos fibers and presents with progressive exertional dyspnea and fibrosis. Symptoms are not as acute as those found in this patient, and a history of asbestos or occupational exposure is needed for the diagnosis.

(Choice 4) Pneumococcal pneumonia is the most common community-acquired pneumonia. It is a lobar pneumonia that does not cavitate or cause lung abscesses. Additionally, presentation of fever, chest pain, dyspnea, and cough occurs more acutely than the 2-week presentation seen in this patient.

26. Question

1 points

An 83 year old woman presents with a 1-year history of increasing forgetfulness and inattentiveness. She has had episodes of confusion, usually occurring at night when she wanders around in her house, disoriented to time and place. According to a family member, she has recently developed paranoid ideation. On a Mini Mental Status examination, she is unable to recall one of three words, but she is able to follow a three-stage command. There is no history of alcohol abuse, major physical illness, or current pharmacologic therapy. Physical examination is unrevealing, and blood and thyroid function tests are within normal limits. Which of the following is the most appropriate next step in diagnosis?

1. ☐ Electroencephalographic studies
2. ☒ MRI of the brain
3. ☐ Cerebral angiographic studies

4. ☐ Lumbar puncture for CSF examination
5. ☐ Brain biopsy

INCORRECT ✖

The correct answer is 2.

Even when the clinical history and neurologic evaluation are consistent with Alzheimer disease, as in this case, MRI studies of the brain may rule out other conditions that may mimic this common dementing disorder. Marked ventricular dilatation without significant cortical atrophy, for example, would suggest normal pressure hydrocephalus, which may respond to CSF shunting. A subdural hematoma may manifest with dementia. An entirely normal-appearing brain may suggest nonorganic causes of dementia, for example.

(Choice 1) Electroencephalographic studies are of limited value in the evaluation of dementing illnesses, except in the case of Creutzfeldt-Jacob disease.

(Choice 3) Cerebral angiographic studies are useful in evaluating the morphology of the cerebral vasculature to detect the location and degree of atherosclerotic stenosis, as well as the presence of aneurysms or vascular malformations.

(Choice 4) Lumbar puncture for CSF examination is uninformative in most cases of dementia. Despite extensive research, a diagnostically useful CSF marker of Alzheimer disease has yet to be found.

(Choice 5) is reserved for those rare cases in which clinical and radiologic investigations have failed to disclose any apparent cause of dementia, and there is evidence of a mass lesion in imaging studies.

27. Question

1 points

A 60 year old man comes to his physician with complaints of easy fatigability and palpitations for the past 6 months. Physical examination is remarkable for pallor of skin and mucous membranes. No evidence of cardiac or respiratory disease is found. Hematologic studies show:

Hemoglobin: 8.4 g/dL

Mean corpuscular volume (MCV): 75 fL

Leukocyte count: 9000/mm³

Platelet count: 380,000/mm³

Serum chemistry studies show a ferritin of 25 ng/L and serum bilirubin within normal values. Peripheral blood smear shows small erythrocytes with marked variability in size. Which of the following is the most appropriate next step in management?

1. ☐ Bone marrow biopsy
2. ☐ Coombs test for anti-red blood cell antibodies

3. ☐ Hemoglobin electrophoresis
4. ☒ Test for occult blood in the stool ✓
5. ☐ Therapeutic trial with oral ferrous sulfate
6. ☐ Treatment with vitamin B₁₂ and folic acid

INCORRECT ✗

The correct answer is 4.

Microcytic anemia with low ferritin levels is characteristically due to iron deficiency. Low serum ferritin indicates depletion of body iron stores. Transferrin saturation falls below 15%. Severe iron deficiency will result not only in reduced mean corpuscular volume (MCV) of red blood cells, but also in variability in their size (anisocytosis) and shape (poikilocytosis). Iron deficiency anemia is often accompanied by a high platelet count. In industrialized countries, iron-deficiency anemia should be assumed to result from chronic blood loss. The most important step in management is to identify the source of bleeding. In men, gastrointestinal hemorrhage is the most common underlying cause of iron-deficiency anemia. Thus, a test for occult blood in the stool is the initial screening study in this situation. Proper investigations must then be carried out to disclose the source of bleeding, which may be due to such conditions as peptic ulcer, gastritis, or colon cancer.

(Choice 1) is not necessary in classic cases of microcytic anemia secondary to iron deficiency. It is sometimes helpful to rule out anemia of chronic disease, which is associated with normal or elevated serum ferritin and increased iron stores in the marrow.

(Choice 2) is one of the initial diagnostic studies performed when there are hematologic signs of hemolytic anemia (e.g., normocytic red blood cells, reticulocytosis, and high unconjugated bilirubin). A positive Coombs test indicates the presence of circulating anti-red blood cell antibodies responsible for hemolysis.

(Choice 3) is mainly used for the diagnosis of qualitative or quantitative disorders of hemoglobin, namely sickle cell anemia and thalassemias. Sickle cell anemia is associated with the typical sickle-shaped red blood cells on peripheral smear. Thalassemias manifest with microcytosis (MCV <75 fl), but ferritin levels are normal/elevated. In addition, morphologic abnormalities of erythrocytes are more pronounced in thalassemia compared with iron deficiency anemia. α -thalassemia trait and β -thalassemia minor are often accompanied by normal or increased numbers of red blood cells.

(Choice 5) is the most appropriate treatment for iron-deficiency anemia. However, this form of anemia is usually a manifestation of an underlying condition that should be identified and treated. Anemia itself is usually not life-threatening, but the underlying cause may well be.

(Choice 6) is effective for megaloblastic anemia secondary to vitamin B₁₂ or folic acid deficiency. In contrast to iron-deficiency anemia, megaloblastic anemia is characterized by macrocytes, i.e., red blood cells with high MCV (usually > 110 fl) and often associated with mild hyperbilirubinemia.

28. Question

1 points

A 28 year old woman presents with painful swelling of her right hand and fingers of 2 days' duration. She has a low-grade fever and is currently menstruating. She denies a past history of sexually transmitted diseases. On examination, her temperature is 38.6 C (101.4 F), blood pressure is 130/70 mm Hg, pulse is 110/min, and respirations are 20/min. The digits on her right hand are swollen and held in mild flexion, with papules and vesicles in the web spaces. Her left knee and ankle are swollen and tender to touch. Laboratory evaluation shows:


Leukocytes: 12,000 with 86% neutrophils

Hemoglobin: 14.0 g/dL

Platelets: 220,000/mm³

Erythrocyte sedimentation rate: 43 mm/hr

X-ray films of the hand, knee, and ankle show no evidence of fracture. Which of the following tests is most likely to confirm the likely diagnosis?

1. ☒ Cultures of cervix, rectum, throat, and blood 
2. ☐ Blood cultures
3. ☐ Arthrocentesis for bacterial cultures
4. ☐ Synovial fluid analysis for cell count
5. ☐ Synovial fluid Gram stain

INCORRECT 

The correct answer is 1.

The acute onset of tenosynovitis is often the initial manifestation of gonococcal arthritis. Risk factors specific to this patient include female sex, menses, and pregnancy. Signs and symptoms include fever and involvement of the knee and ankles. Obtaining cultures from the cervix, rectum, pharynx, and blood will give a higher probability of a positive result than cultures from the joint fluid alone. Gonococcal arthritis is confirmed by prompt response to antibiotics.

(Choice 2) Blood cultures are positive in only 40% of patients.

(Choice 3) The immunologic reaction to nonviable fragments of the organism's cell wall will interfere with culture of the organism from skin or joints. These cultures will be positive in less than 50% of cases.

(Choice 4) A synovial fluid cell count is helpful in making the diagnosis of septic arthritis, but not in identifying the pathogen causing the infection.

(Choice 5) Synovial fluid Gram stain is typically positive in only 25% of cases.

29. Question

1 points

A 39 year old California rancher consults a physician because of chronic abdominal pain. The man has been a sheepherder for 23 years. Physical examination is notable for a palpable liver mass but is otherwise unremarkable. Ultrasound demonstrates a 15-cm cyst bearing multiple daughter cysts in the liver. CT confirms the presence of the cysts and demonstrates the presence of a finely calcified cyst rim. Which of the following is the most likely diagnosis?

1. ☐ Ascariasis
2. ☒ Echinococcosis ✓
3. ☐ Fascioliasis
4. ☐ Schistosomiasis
5. ☐ Toxocariasis

INCORRECT ✗

The correct answer is 2.

This is hydatid disease, due to infection with *Echinococcus granulosus* (rarely *Echinococcus multilocularis*). The life cycle of this parasitic worm usually alternates between sheep and canine carnivores (including sheep herding dogs). Man is an accidental host. Endemic areas correspond to the major sheep-herding areas of the world: the Mediterranean, the Middle East, Australia, New Zealand, South Africa, and South America. Smaller foci of the disease are found in California, Canada, and Alaska. The ingested egg hatches in the intestine, and the larva migrates to the human liver, lungs, or, less commonly, other body sites. Over years, the larva forms the hydatid cyst, which is a large, fluid-filled bladder that develops multiple brood capsules in its periphery, each of which contains numerous small infective scolices. So long as the cyst does not rupture, the patient may be asymptomatic. However, rupture (including accidental surgical rupture) can cause an anaphylactic reaction (the cyst fluid is highly antigenic) or a “metastatic” infection, as the up to millions of infectious scolices are released. Treatment can be either with very careful surgical resection or with percutaneous aspiration under CT guidance followed by instillation of a scolecicidal agent and then respiration. If the case is inoperable, or if an intra operative spillage occurs, albendazole can be used to suppress growth or kill the cysts.

(Choice 1) can cause biliary obstruction by the adult worms and granulomas in the liver by the larvae.

(Choice 3) can acutely cause tender hepatomegaly with fever and eosinophilia, and can chronically cause cholangitis and biliary fibrosis.


(Choice 4) can cause a severe granulomatous reaction to the ova, producing hepatosplenomegaly, pipe stem fibrosis, and portal hypertension.

(Choice 5) can cause visceral larva migrans and hepatomegaly with granulomas.

30. Question

1 points

A solitary nodule is detected on a chest x-ray film in an otherwise healthy 25 year old man. The patient has been smoking 10 cigarettes daily for 3 years. The nodule is located in the right middle lobe and measures approximately 1.5 cm. Previous chest x-ray films are not available for comparison. CT scan reveals a solitary lung nodule with a smooth contour and diffuse calcifications. No other pulmonary lesions are found. Physical examination and routine laboratory tests are normal. Which of the following is the most likely diagnosis?

1. ☐ Aspergilloma
2. ☐ Bronchogenic carcinoma
3. ☒ Hamartoma 
4. ☐ Pulmonary abscess
5. ☐ Sarcoidosis
6. ☐ Secondary (reactivated) tuberculosis

INCORRECT 

The correct answer is 3.

This case raises the problem of the clinical approach to a solitary pulmonary nodule radiographically detected in an otherwise healthy subject. In large surveys, 60% of solitary pulmonary nodules are benign, and granulomas represent the most common benign lesion. However, there is no infallible clinical or radiologic set of criteria that can discriminate between benign and malignant lesions. Factors favoring a benign lesion include young age (<40 to 45 years), small size (<2 cm) and smooth margins of the lesion, absence of symptoms, and slow growth on successive films. Generally, calcification is not a malignant feature, and presence of "popcorn-like" calcifications definitely favors hamartoma. A hamartoma is a malformative lesion resulting from random admixture of tissues normally present in the lung, including cartilage, bronchial mucosa, and smooth muscle. It is usually discovered incidentally.

(Choice 1) An aspergilloma is a fungus ball (mycetoma) that develops in a pre-existing lung cavity. It may be seen as an asymptomatic radiographic abnormality (a crescent of air outlining a solid mass that moves with position changes) that is usually in the upper lobe. An aspergilloma can cause hemoptysis, and there are often other systemic signs. Hemoptysis is frequently present, and signs and symptoms of the underlying disease should be found.

(Choice 2) may present as a solitary nodule, but patients are typically older and have a much longer exposure to cigarette smoking. Calcifications usually are not seen in malignant pulmonary tumors.

(Choice 4) manifests as a pulmonary infiltrate with cavitation and, frequently, an air-fluid level. Accompanying symptomatology, such as fever and cough, is usually present.

(Choice 5) affects the lungs frequently. A diffuse multinodular infiltrate is seen on chest x-ray, most commonly associated with hilar lymphadenopathy. The patient may have signs and symptoms of restrictive pulmonary disease.

(Choice 6) manifests with multiple nodular and cavitary infiltrates in the upper lobes; the patient has low-grade fever, malaise, weight loss, and cough. However, primary tuberculosis may result in a calcified nodule within the lung parenchyma, which is the remnant of an old Ghon complex.

31. Question

1 points

A 65 year old woman is admitted with a 3-week history of headache over the right temporal region, malaise, fever, morning stiffness, and weight loss. On physical examination, scalp tenderness is appreciated. Her temperature is 38.5 °C (101.3 F), blood pressure is 142/84 mm Hg, pulse is 85/min, and respirations are 14/min. There is no loss of visual acuity, and fundusoscopic examination is unremarkable. Laboratory studies show the following:


Hematocrit: 40.3%

Hemoglobin: 11.9 g/dL

Leukocytes: 7800/mL (neutrophils 68%)

Erythrocyte sedimentation rate (ESR): 80 mm/h

After reviewing the results, the physician initiates high dose prednisone therapy. Which of the following is most likely to confirm the diagnosis?

1. ☐ CT scan of the head
2. ☐ Lumbar puncture
3. ☐ Muscle biopsy
4. ☒ Temporal artery biopsy 
5. ☐ Visual evoked potentials

INCORRECT 

The correct answer is 4.

The patient has signs, symptoms, and laboratory findings consistent with giant cell arteritis, which is a systemic disease overlapping with polymyalgia rheumatica. It affects the superficial temporal artery most commonly but may involve any medium-sized or large caliber artery in the body. The most characteristic elements in the diagnosis include scalp tenderness (sometimes associated with palpation of a nodular and tender temporal artery), elevated ESR, a frequently normal leukocyte count, and age older than 55 years. The major

risk of this condition is blindness deriving from extension of the inflammatory process to the ophthalmic artery. Prednisone therapy must be immediately started, and a biopsy of the temporal artery should be obtained to confirm the diagnosis.

(Choice 1) would be useful to obtain information in case of suspected intracranial lesions, especially bleeding, infarct, or a space-occupying mass.

(Choice 2) for CSF examination would have no diagnostic value in this patient. Meningitis would develop more rapidly, usually with nuchal headache and rigidity. Subarachnoid hemorrhage results in thunderclap headache followed by changes in mental status.


(Choice 3) is useful in investigating muscular disorders. Myalgia, arthralgia, and stiffness in the pelvic and shoulder girdles are often present in this condition, which may mimic a myopathy.

(Choice 5) are especially useful in evaluation of optic nerve involvement in demyelinating diseases.

32. Question

1 points

A 35 year old man goes to the emergency department because he has developed a severe case of hives. He has never had hives before. Physical examination demonstrates multiple wheals and erythematous patches over his body, which responds to subcutaneous epinephrine. The patient's sclera are slightly yellow-tinged. Results of the chest and abdomen examination are within normal limits. Screening biochemistry tests demonstrate an AST (SGOT) of 350 U/L and an ALT (SGPT) of 300 U/L. Which of the following is the most likely diagnosis?

1. ☐ Alcoholic cirrhosis
2. ☐ Alpha1 -antitrypsin deficiency
3. ☐ Hemochromatosis
4. ☐ Hepatitis A
5. ☒ Hepatitis B 

INCORRECT 

The correct answer is 5.


Urticaria, or hives, is a common condition that can be quite difficult to manage because it may have such a wide variety of triggers. The underlying basis of the condition is mediator- (histamine, serotonin, leukotrienes) driven vasodilation with accompanying dermal edema. The triggers for mediator release from mast cells or basophils may be either allergic (IgE bound to antigen) or non immunologic direct pharmacologic effects. Although there is a wide range of possible triggers for urticaria, it is important to note that up to 25% of cases of acute hepatitis B present with urticaria. It is therefore well worth checking the sclera (the most

visible site in tanned or dark-skinned individuals) for jaundice in patients with newly diagnosed hives. Other triggers include contact chemicals, drugs, food allergens, pressure, sunlight, insect stings, and hereditary predispositions. All the other choices can produce acute or chronic hepatitis but do not have a significant association with urticaria.

33. Question

1 points

A 47 year old Brazilian immigrant presents with fatigue and dyspnea. He has been healthy for the past 10 years. The patient denies fever, cough, chills, or weight loss. On physical examination there are no murmurs, the pulse and the rhythm are regular, S1 is normal, and S2 is split. This split increases with inspiration and persists with expiration. Which of the following ECG findings is most consistent with the auscultatory findings in this patient?

1. ☐ Acute ST segment elevation in the anterior leads
2. ☐ Decreased PR interval
3. ☐ Early repolarization
4. ☐ Marked T wave inversion
5. ☒ Right bundle branch block 

INCORRECT 

The correct answer is 5.

A persistently wide split S2 is typically seen in patients with right bundle branch block, pulmonic stenosis, pulmonary embolus, and ectopic or pacemaker beats originating in the left ventricle. All these conditions produce delayed function of the right ventricle. In a Brazilian patient, Chagas disease (caused by *Trypanosoma cruzi*) should be considered as a possible cause of heart block. This trypanosomal infection is endemic in Central and South American countries, and is a cause of rhythm disturbances, cardiomyopathy, and thromboembolism.

(Choice 1) ST segment elevation is seen in acute anterior myocardial infarction.

(Choice 2) A short PR interval is associated with a loud s_1 (when the mitral valve slams shut).


(Choice 3) Early repolarization will produce ECG changes only with no specific findings on auscultation.

(Choice 4) Although modest T wave changes can sometimes be associated with right bundle branch block, marked T wave inversions are more typical of right or left ventricular hypertrophy and myocardial ischemia or infarction.

34. Question

1 points

An otherwise healthy 60 year old man undergoes a health maintenance examination. Physical examination and medical history are unremarkable. A blood chemistry panel is normal except for a serum calcium level of 11 mg/dL when corrected for serum albumin. The measurement is repeated two times, giving values of 10.5 mg/dL and 11.2 mg/dL, respectively. Serum phosphorus is 2.5 mg/dL, and alkaline phosphatase is 50 U/L. Immunoradiometric assay (IRMA) reveals higher than normal serum levels of parathyroid hormone. Urine calcium excretion is within normal limits. The patient denies previous renal colic or urinary tract infections. Which of the following is the most appropriate next step in management?

1. ☐ Bone x-ray films
2. ☐ Extensive cancer screening
3. ☒ Generous fluid intake 
4. ☐ Treatment with bisphosphonates (e.g., alendronate)
5. ☐ Surgical exploration of the neck

INCORRECT **The correct answer is 3.**

Hyperparathyroidism is one of the most frequent endocrinologic conditions, found in 1 in 1000 adults. In most cases, hyperparathyroidism is asymptomatic, manifesting only with hypercalcemia often discovered incidentally in the course of routine laboratory investigations conducted for other reasons. The most common cause is a parathyroid adenoma. Calcium levels should be corrected for albuminemia, since most of the calcium is bound to serum albumin. If hypercalcemia is the only clinical sign, without associated complications such as renal stones, bone disease, or cataracts, abundant fluid intake is the only measure recommended to prevent formation of calcium stones in the urinary system.

(Choice 1) Bone x-ray films are not necessary for the diagnostic work-up of hypercalcemia and hyperparathyroidism, unless bone pain or pathologic fractures are present. X-ray films may reveal bone rarefaction, which is often more pronounced in the phalanges and in subperiosteal locations.

(Choice 2) Extensive cancer screening would be appropriate if hypercalcemia were suspected to be secondary to neoplasms (e.g., lung, breast, renal cell carcinoma, multiple myeloma). Hypercalcemia of malignancy can be due to secretion of PTH-like substances or bone destruction by metastases. In either case, plasma levels of PTH detected by IRMA would be low. In fact, the PTH-like peptides produced by some tumors (lung cancer) are not identified by IRMA. Alkaline phosphatase would be high in the presence of osteolysis.

(Choice 4) Treatment with bisphosphonates (e.g., alendronate) may serve as an alternative treatment to prevent excessive bone resorption.

(Choice 5) Surgical exploration of the neck is aimed at finding the source of increased PTH production, which is usually a parathyroid adenoma. Removal of the adenoma is recommended when patients have symptomatic hyperparathyroidism, with recurrent renal stones or bone disease. Indications for surgical treatment in asymptomatic patients include very high calcium levels, high urinary excretion of calcium, extreme bone loss, or difficulty in medical follow-up.

35. Question

1 points

A 27 year old African American man visits his primary care physician because of recent onset of «yellowness in the white of his eyes.» His recent history is significant for a “chest cold” for which he is taking trimethoprim sulfamethoxazole; he is also taking fluoxetine for depression. On examination, the scleras are icteric and the mucosa beneath the tongue appears yellow. No hepatosplenomegaly is present. Laboratory studies are as follows:

Hemoglobin: 11.1 g/dL

Hematocrit: 34%

Total bilirubin: 6.2 mg/dL

Conjugated (direct) bilirubin: 0.8 mg/dL

Alkaline phosphatase: 77

AST (SGOT): 24

ALT (SGPT): 22

Which of the following is the most likely explanation for this patient's jaundice?

1. ☐ Acute infectious hepatitis
2. ☐ Cholestatic liver disease
3. ☐ Drug reaction from fluoxetine
4. ☒ Drug reaction from trimethoprim-sulfamethoxazole ✓

INCORRECT ✗

The correct answer is 4.

This man has glucose-6-phosphate dehydrogenase (G6PD) deficiency (as do 10% of African American males). G6PD serves to protect the RBCs from oxidative damage by maintaining high intracellular levels of NADPH. People of Mediterranean descent can also have G6PD deficiency, but to a much greater degree. Therefore, hemolytic episodes in this population are more severe (and can be fatal), as compared with those in the African American population, which are usually mild and self-limited. Common oxidative stressors that initiate hemolysis are drug reactions (especially sulfa drugs), febrile illnesses, and fava bean ingestion.

(Choice 1) Acute infectious hepatitis would more likely present with fatigue, fever, abdominal pain, hepatomegaly, and high elevations of AST and ALT (often into the 1000s).

(Choice 2) Cholestatic liver disease more often presents with elevation of alkaline phosphatase, along with mild elevations of AST and ALT. This patient has elevated unconjugated bilirubin levels, as in hemolytic disorders. Both hepatocellular (hepatitis) and cholestatic liver disease cause more conjugated (as opposed to unconjugated) hyperbilirubinemia.

(Choice 3) The most common side effects of fluoxetine (a selective serotonin reuptake inhibitor) are anxiety, agitation, and insomnia.

36. Question

1 points

A 72 year old man complains of malaise and easy fatigability for the past 3 weeks. His past medical history is significant for gout and pneumonia. He lives alone and usually drinks two six-packs of beer daily. His temperature is 36.9 C (98.4 F), blood pressure is 160/90 mm Hg, pulse is 88/min, and respirations are 19/min. Thyroid palpation is normal, and heart, lung, and abdomen examination results are within normal limits. There is a diffuse ecchymotic rash spreading out from hair follicles on the limbs and trunk. The patient most likely has a deficiency of which of the following vitamins?

1. ☐ Niacin
2. ☐ Thiamin
3. ☐ Vitamin B₁₂
4. ☒ Vitamin C 
5. ☐ Vitamin D

INCORRECT 

The correct answer is 4.

This question examines the different aspects of vitamin deficiencies. Scurvy is a deficiency of vitamin C that may occur in older men who cook for themselves. The features are perifollicular hemorrhage and purpura, splinter hemorrhages, and gum involvement. Normochromic, normocytic anemia is common.

(Choice 1) Niacin deficiency, known as pellagra, is a chronic wasting disease associated with dermatitis, dementia, and diarrhea. The skin lesions are characterized by hyperkeratosis, hyperpigmentation, and desquamation. The course is progressive over several years. Niacin is found in cereals.

(Choice 2) Vitamin B₁ (thiamine) deficiency, known as beriberi, occurs in alcoholics and food faddists. Two manifestations of deficiency include cardiovascular disease (high output failure) and neurologic disorders (e.g., Wernicke-Korsakoff syndrome, characterized by

peripheral neuropathy, a global confusional state, retrograde amnesia, and confabulation).

(Choice 3) Vitamin B₁₂ deficiency causes a macrocytic anemia. Patients may complain of a sore tongue or weight loss. Neurologic manifestations, including weakness and ataxia from demyelination, are the most worrisome. Causes include pernicious anemia, gastrectomy, and ileal abnormalities.

(Choice 5) Vitamin D deficiency causes disorders of bone mineralization, namely rickets in children and osteomalacia in adults.

37. Question

1 points

A 40 year old man with a history of type V hyperlipoproteinemia is brought to the emergency department 3 hours following the abrupt onset of severe deep epigastric pain, nausea, and vomiting. The pain is steady and radiates to the back. The patient is agitated and has cool, clammy skin. His temperature is 38.5 °C (101 °F), blood pressure is 100/70 mm Hg, pulse is 110/min, and respirations are 22/min. Abdominal examination reveals tenderness in the upper abdomen, without guarding. A plain x-ray film shows an air-filled intestinal loop in the left upper quadrant. Laboratory investigations show:

Glucose: 150 mg/dL

LDH: 150 U/L

ALT: 90U/L

AST: 80U/L

Amylase: 120 U/L

Lipase: 30 U/L

Calcium: 7 mg/dL

C-reactive protein: 1.2 mg/dL

Which of the following is the most likely diagnosis?

1. ☐ Acute cholecystitis
2. ☐ Acute hepatitis
3. ☒ Acute pancreatitis ✓
4. ☐ Bowel perforation
5. ☐ Mesenteric ischemia
6. ☐ Ureteral lithiasis

INCORRECT ✗

The correct answer is 3.

Although the whole clinical presentation is characteristic of acute pancreatitis, normal or slightly elevated serum levels of pancreatic enzymes seem to contrast with such a diagnosis. Type I and type V hyperlipoproteinemia are rare conditions predisposing to acute pancreatitis (the two most frequent are cholelithiasis and alcoholism). However, hypertriglyceridemia itself may often falsely depress amylase and lipase levels in the presence of otherwise typical clinical features of pancreatitis. Note, however, other classic laboratory and radiologic signs of acute pancreatitis present in this case: neutrophilic leukocytosis, hyperglycemia, hypocalcemia, elevated C-reactive protein, and the “sentinel loop” (air-filled loop of small bowel in the left upper quadrant). The latter parameter is often used as a radiologic marker of pancreatic damage.

(Choice 1) is associated with gallstones in the great majority of cases. Often, it develops when a stone occludes the cystic duct. Severe pain in the right upper quadrant or epigastrium and leukocytosis are present, but none of the other signs characteristic of acute pancreatitis are seen.

(Choice 2) is associated with increased levels of serum aminotransferases. Pain is relatively mild compared with the extreme pain of acute pancreatitis. Jaundice is often present, although pancreatitis may also cause mild elevation of direct bilirubin because the pancreas becomes swollen and the common bile duct is blocked.

(Choice 4) also presents with a dramatic clinical picture of pain of sudden onset, shock, and rigid abdomen. Pancreatic enzymes may be elevated. A plain x-ray film taken in upright position reveals air underneath the diaphragm.

(Choice 5) due to cardio embolism or atherosclerosis of mesenteric vessels presents with acute abdominal pain that is typically out of proportion to physical examination findings. The typical patient is over 50 years old and presents with acute left-sided abdominal pain that begins in the left iliac fossa, with nausea, vomiting, diarrhea, and abdominal guarding. The patient may have had similar previous episodes, or there may be associated symptoms of cardiovascular disease. Plain films show thickened bowel walls, indicating a paucity of gas in the intestines. Specific radiologic signs are pneumatosis intestinalis (i.e., submucosal gas), bowel wall thumbprinting, and portal vein gas. Although patients with hypertriglyceridemia are at risk for cardiovascular diseases, the most likely cause of this patient’s symptoms is acute pancreatitis.

(Choice 6) is in the differential diagnosis of conditions mimicking acute pancreatitis. However, the pain is often referred to the flank region and radiates toward the ipsilateral perineum. Gross or microscopic hematuria is usually present. Pancreatic enzymes are not elevated, and neutrophilic leukocytosis is absent.

38. Question

1 points

Due to a recent and sudden death of a rival college football player, a local university wishes to implement changes in its health care policies. The school is particularly concerned about the risk for sudden cardiac death in players with previously undiagnosed heart conditions. A pre-

participation evaluation is to be performed on all of the school's athletes. Which of the following is considered the most cost-effective method of screening young athletes at risk for sudden cardiac death?

1. ☒ Careful medical history and examination ✓
2. ☐ Chest x-ray
3. ☐ Echocardiography
4. ☐ Exercise electrocardiography
5. ☐ Resting electrocardiography

INCORRECT ✗

The correct answer is 1.

Sudden cardiac death (SCD), defined as any unexpected death of proven cardiac origin, and is a rare event in young, competitive athletes. However, it raises the question of which pre-participation screening methods should be used for prevention. A consensus document published by the American Heart Association in 1996 (Circulation 1996; 94:850) indicates that the most feasible and cost-effective approach is to perform a careful medical history (including personal and family history) and cardiac examination to identify subjects at risk. Pertinent histories, cardiac auscultation, and assessment of exercise-induced symptoms are all essential to primary prevention of SCD in the athletic population.

(Choice 2) would not be an adequate screening test to detect cardiac abnormalities that may result in sudden death.

(Choice 3) is certainly an effective test to demonstrate cardiac abnormalities, such as left ventricular hypertrophy or valvular disease, but its cost as a pre-participation screening in all competitive athletes would be exorbitant.

(Choices 4 & 5) Both exercise cardiography and resting cardiography would also result in excessive costs.

39. Question

1 points

A 20 year old male college student is participating in Marathon and collapses one third of the way through the race. He is a well developed, athletic man who frequently plays basketball and tennis. He has no past medical history, except for a tonsillectomy at 9 years of age. There were no symptoms before he collapsed to the ground and lost consciousness. The patient is immediately rushed to the nearest emergency room but is pronounced dead on arrival. Which of the following is the most likely underlying cause of his sudden death?

1. ☐ Aortic stenosis
2. ☐ Arrhythmogenic right ventricular dysplasia
3. ☐ Coronary anomalies
4. ☐ Hypertrophic cardiomyopathy ✓
5. ☐ Isolated left ventricular hypertrophy
6. ☐ Myocarditis
7. ☐ Ruptured aorta

INCORRECT ✗

The correct answer is 4.

A fatal arrhythmia is the immediate cause of demise in sudden cardiac death (SCD), but the underlying conditions are extremely variable. Non-atherosclerotic causes are prevalent in the young population, but coronary artery disease becomes more frequent in athletes older than 40. Hypertrophic cardiomyopathy has been found in approximately one third of cases of SCD in young athletes who present with SCD. This condition is frequently hereditary (hence the need for a careful family history) and may manifest with arrhythmias, chest pain, and signs of subaortic stenosis. Coronary anomalies (**Choice 3**), including atherosclerotic changes, represent the second most frequent cause of SCD in competitive athletes.

(**Choices 1,2,5,6 & 7**) Aortic stenosis, arrhythmogenic right ventricular dysplasia, isolated (and otherwise unexplained) left ventricular hypertrophy, myocarditis, and ruptured aorta (**Choice 7**) are rare causes of SCD. Some studies have shown that an increased myocardial mass, per se, is a risk factor for SCD, even without coexisting pathologic changes.

40. Question

1 points

A 31 year old man is admitted to the hospital for suspicion of gastrointestinal bleeding. He has no significant past medical history but takes daily nonsteroidal anti-inflammatory agents for pain in his knee. He presented to the hospital 6 hours ago after he noticed melanic stools while at home. He is observed to have copious bright red blood per rectum. On physical examination, he is tachycardic, and his peripheral pulses are faint but present. His mental status appears normal. His extremities are cool to the touch. An intravenous line is placed. Which of the following is the most appropriate next step in management?

1. ☐ Order an urgent type and cross match for blood
2. ☐ Order an urgent hematocrit level

3. ☒ Begin parenteral administration of large volumes of normal saline solution ✓
4. ☐ Begin parenteral administration of large volumes of colloid solution
5. ☐ Place two additional large bore peripheral intravenous catheters

INCORRECT ✗

The correct answer is 3.

The management of acute hemorrhage is the same for almost all patients, regardless of the etiology. In this case, a patient who is actively bleeding with apparent marginal vital signs requires immediate restoration of blood pressure via fluid resuscitation with at least 3 L of crystalloid solution (normal saline or lactated Ringer's) for every liter of blood lost.

Tachycardia and hypotension are signs of a moderate to severe loss of blood volume, and no delay in initiating fluid therapy is warranted.

(Choice 1) Ordering an urgent type and cross match for blood, although appropriate for the overall short-term management of this patient, is not an acceptable therapeutic option in the face of active bleeding with no fluid resuscitation in progress.

(Choice 2) Ordering an urgent hematocrit level is not useful in this case because hematocrit levels do not change for at least 4 hours after an acute bleed. In addition, it offers no therapeutic benefit and will not change the short-term management of this patient.

Internal Medicine Test 3 Answers and Explanations

(Choice 4) Beginning parenteral administration of large volumes of colloid solution is not indicated in this case. In fact, colloid (albumin, Hetastarch, Hetaspan) is rarely indicated for fluid resuscitation since it may actually precipitate pulmonary edema. The only clear indication for colloid is in the therapy of early burns, as these patients have capillary leaks and are losing protein and albumin.

(Choice 5) Placing two additional large bore peripheral IV catheters is indicated only AFTER fluid resuscitation has been started through whatever peripheral or central access is available. The concept here is that large bore IV catheters or central catheters are required for aggressive fluid resuscitation, but not at the expense of delaying therapy through an already available, but smaller, route.

41. Question

1 points

A 40 year old man presents to the physician because of exertional dyspnea of recent onset. The patient appears comfortable at rest but says that he becomes short of breath with minimal effort. His temperature is 37 °C (98.6 °F), blood pressure is 162/65mm Hg, pulse is 92/min with a rapid rise and fall, and respirations are 15/min. Chest examination reveals a prominent and laterally displaced apical impulse. A soft diastolic decrescendo murmur is heard along the left sternal border. Bilateral crackles are present at the lung base. The liver is not palpable, and there is no sign of peripheral edema. Which of the following is the most likely diagnosis?

1. ☒ Aortic insufficiency ✓
2. ☐ Aortic stenosis
3. ☐ Hypertrophic obstructive cardiomyopathy
4. ☐ Infective endocarditis
5. ☐ Mitral stenosis
6. ☐ Ventricular septal defect

INCORRECT ✗

The correct answer is 1.

The patient manifests early left ventricular failure secondary to aortic regurgitation. The diastolic murmur in decrescendo along the left sternal border and the wide differential between systolic pressure and diastolic pressure are highly characteristic. The rapid rise and fall of peripheral pulses is known as Corrigan pulse. Similar hemodynamic changes (hyperdynamic circulation) may be observed in hyperthyroidism, large arteriovenous fistulas, beriberi, and patent ductus arteriosus.

(Choice 2) Aortic stenosis produces a “diamond-shaped” (crescendo-decrescendo) systolic murmur often radiating to the neck. In contrast to aortic regurgitation, aortic stenosis is associated with a narrow differential between systolic and diastolic pressures.


(Choice 3) Hypertrophic obstructive cardiomyopathy (HOCM) may simulate aortic stenosis or coronary artery disease in symptoms. HOCM often presents with symptoms of exertional angina, dyspnea, and/or syncope. It is also widely known to be a cause of sudden cardiac death in young athletes. Diagnosis is usually made by recognizing the signs associated with outflow obstruction and the symptoms that are predominantly characterized by diastolic dysfunction. Characteristic findings on physical examination include a bifid carotid pulse, an S₄ heart sound, and a harsh systolic crescendo decrescendo located at the apex and left sternal border. The murmur increases with the Valsalva maneuver upon standing and with amyl nitrite, and it decreases with sudden squatting, leg rising, and handgrip exercises.

(Choice 4) Infective endocarditis may be accompanied by murmurs, usually secondary to valvular insufficiency, but systemic signs and symptoms of infection would be present.

(Choice 5) Mitral stenosis leads to a diastolic rumbling murmur audible at the apex or central precordium. An opening snap soon after S₂ often precedes the murmur and is related to the forced opening imposed by the atrial contraction on rigid mitral valve leaflets.

(Choice 6) Ventricular septal defect (VSD), the most frequent congenital cardiac anomaly, is associated with a pansystolic murmur at the left sternal border, often accompanied by a thrill.

A 42 year old man with AIDS presents with a chief complaint of persistent watery, non-bloody diarrhea. He is not on any medications and denies recent travel or fever. On physical examination, his abdomen is slightly bloated, with mild tenderness to palpation. There is no occult blood in his stool. Stool samples for leukocytes, culture, ova, and parasites are all negative x 3. Which of the following is the most appropriate next step in diagnosis?

1. ☐ Abdominal CT
2. ☐ Cytomegalovirus (CMV) antigenemia
3. ☒ Modified acid-fast stain of the stool 
4. ☐ PPD test
5. ☐ Small bowel biopsy

INCORRECT 

The correct answer is 3.

In cases of HIV and persistent diarrhea, the differential diagnosis includes *Cryptosporidium* and *Isospora*. A fresh stool specimen should be examined for parasites using a modified acid-fast stain for both pathogens. These protozoal infections are the most common enteric protozoal infections in AIDS patients throughout the world.

(Choice 1) may show changes in the colon wall consistent with inflammation and edema. However, the scan will probably not be helpful in the principal diagnosis of this patient's condition.

(Choice 2) is an index of infection with CMV, which is common in an immunocompromised host such as a patient with HIV or one undergoing chemotherapy. Gastrointestinal symptoms are the result of ulcers in the esophagus, stomach, small intestine, or colon, which may cause rectal bleeding, bloody diarrhea, or perforation. Ganciclovir is used in the alleviation of symptoms.

(Choice 4) is used to determine whether a patient has had prior exposure to *Mycobacterium tuberculosis*. Biopsy may show caseating granulomas. In a condition such as this, the patient would also complain of bloody diarrhea and weight loss.

(Choice 5) If diagnostic studies are negative and diarrhea persists, patients should undergo endoscopy. Biopsy of the duodenum or small bowel may show histologic evidence of cryptosporidial, microsporidial, mycobacterial, or cytomegalovirus (CMV) infection.

43. Question

1 points

A previously healthy 23 year old man comes to the physician because of a febrile illness that developed over a 2-day period. He has had temperatures to 39.4 °C (102.9F), with rigors, cough productive of mucopurulent sputum, and right chest pain. At this time, his temperature is 38.7 C

(101.7 F), blood pressure is 132/80 mm Hg, pulse is 110/min, and respirations are 22/min. There is no cyanosis. Diminished tactile fremitus, dullness on percussion, and bronchial breathing are present in the right lower lung. A chest x-ray film shows consolidation of the right lower lobe. Microscopic examination of the sputum reveals gram-positive diplococci. The patient denies previous allergic drug reactions. Which of the following is the most appropriate pharmacotherapy?

1. ☐ Cefazolin
2. ☐ Erythromycin
3. ☒ Penicillin ✓
4. ☐ Tetracyclines
5. ☐ Trimethoprim-sulfamethoxazole
6. ☐ Vancomycin

INCORRECT ✗

The correct answer is 3.

The symptomatology, x-ray evidence of lobar consolidation, and the finding of gram-positive diplococci in the sputum all support a diagnosis of acute pneumonia due to pneumococcus. Microscopic examination of gram-stained sputum is more sensitive than culture in identifying pneumococcus. Penicillin is the agent of choice, administered orally (penicillin V) on an outpatient basis in uncomplicated pneumonia, or parenterally (IV penicillin G) for seriously ill patients.

(Choice 1) Patients with a history of mild allergic reactions to penicillin, but without anaphylaxis or other serious reactions should be treated with cefazolin.

(Choice 2) is a safe alternative to penicillin for pneumococcal pneumonia and covers the other common bacterial pathogens of community acquired pneumonia, including (besides pneumococcus) *Mycoplasma pneumoniae*, *Chlamydia pneumoniae*, and *Legionella*.

(Choice 4), such as doxycycline, are the preferred drugs against *Chlamydia pneumoniae* and a good alternative to erythromycin for infections due to *Mycoplasma pneumoniae* and *Moraxella catarrhalis*.

(Choice 5) The combination of trimethoprim and sulfamethoxazole can be used as a second-line treatment in penicillin-allergic patients. It can also be used in case of pneumonia caused by highly penicillin-resistant strains of pneumococcus.

(Choice 6) is used against strains of pneumococcus highly resistant to penicillin or in case of severe allergic reaction to previous penicillin administration.

44. Question

1 points

An otherwise healthy 22 year old woman presents to her physician because of daily headaches

over the past 2 weeks. The headaches have a vise-like character, seem to be more intense in the back of the head, and are often precipitated by emotional stress. Physical examination fails to disclose focal neurologic or visual deficits. Which of the following is the most appropriate initial step in patient care?

1. ☐ Antidepressant drugs
2. ☐ Calcium-channel antagonists
3. ☐ Ergotamine-containing preparations
4. ☒ Nonsteroidal anti-inflammatory drugs (NSAIDs) ✓
5. ☐ Sumatriptan

INCORRECT ✗

The correct answer is 4.

The clinical features of these headaches, with their characteristic vise-like quality, immediately suggest tension headaches, which are often associated with tightness of the neck muscles. Anxiety, fatigue, and noise may act as precipitating triggers. Exploration of underlying causes of anxiety is often useful, but a trial with aspirin or other NSAIDs may be sufficient in most cases. Tension headaches may show overlapping features with migraine. **(Choice 1)** Antidepressant drugs are used to treat depression and its manifestations, including depression headaches. A full neuropsychiatric evaluation is necessary to begin such treatment.

(Choice 2) Calcium-channel antagonists are effective in decreasing the frequency of attacks of migraine, although they do not influence the intensity and duration of pain.

(Choices 3 & 5) Ergotamine-containing preparations and sumatriptan represent the treatments of choice for acute migraine.

45. Question

1 points

A 42 year old woman presents to her physician because of recent urinary tract infections (UTIs). She has been on an unknown oral antibiotic chronically. She has a temperature of 37.2 °C (99.0 °F), and costovertebral angle tenderness is noted on the left side. A plain film of the abdomen reveals a radiopaque density filling the left renal pelvis and calyces. Which of the following is the most likely pathogen?

1. ☐ Bacteroides fragilis
2. ☐ Clostridium difficile

- 3. ☐ Escherichia coli
- 4. ☒ Proteus mirabilis ✓
- 5. ☐ Streptococcus bovis

INCORRECT ✗

The correct answer is 4.

The patient is experiencing recurrent UT is associated with the presence of kidney stones (the radiopaque density in the renal pelvis and calyces). Urease-producing organisms, such as *Proteus mirabilis*, create a high urinary pH, contributing to the development of struvite kidney stones. The stone may cause obstruction and urinary stress, leading to infection. These stones are relatively soft and are usually amenable to percutaneous nephrostomy. Aceto-hydroxamic acid is an effective urease inhibitor. *Pseudomonas* and *Providencia* are less common urease-producing organisms that may cause struvite calculi.

(Choice 1) is associated with peritonitis in patients with an intra-abdominal abscess.

(Choice 2) is associated with pseudomembranous colitis.

(Choice 3) is the most common cause of UTI.

(Choice 5) is a non-enterococcal type of group D *Streptococcus*.

46. Question

1 points

A 35 year old woman has developed marked thickening of the skin of her hands, particularly her fingers. This thickening is accompanied by hyperpigmentation and is so marked as to limit the range of motion of her fingers. If this patient goes on to develop gastrointestinal problems, which of the following is most likely?

- 1. ☐ Carcinoid tumor
- 2. ☐ Duodenal peptic ulcer
- 3. ☒ Esophageal dysfunction ✓
- 4. ☐ Pneumatosis cystoides intestinalis
- 5. ☐ Sacculations of the colon
- 6. ☐ Small bowel adhesions

INCORRECT ✗

The correct answer is 3.

The changes seen are those of scleroderma; if other organs become involved, the term systemic sclerosis is appropriate. This disease is characterized by diffuse fibrosis, degenerative changes, and vascular abnormalities. The most common significant internal involvement in these patients is esophageal dysfunction (which may predispose for reflux disease with risk of Barrett esophagus and cancer of the esophagus), which occurs as a result of replacement of the muscle of the esophagus by densely fibrotic, scar-like tissue. Other gastrointestinal complications include pneumatosis cystoides intestinalis (see below), sacculations of the colon and ileum (see below), biliary cirrhosis, and malabsorption secondary to bacterial overgrowth in the poorly functional small bowel.

(Choice 1) does not have an increased incidence in systemic sclerosis.

(Choice 2) does not have an increased incidence in systemic sclerosis, although esophageal peptic ulcer, secondary to reflux problems, does.

(Choice 4) is an uncommon intestinal complication of systemic sclerosis in which degeneration of the muscularis mucosa allows the entry of air into the intestinal wall.

(Choice 5) and ileum are broad outpouching (very fat diverticula) that can sometimes complicate systemic sclerosis as a result of smooth muscle atrophy.

(Choice 6) is not a feature of systemic sclerosis. They are commonly seen following abdominal surgery (e.g., for appendicitis) and in inflammatory conditions, such as Crohn disease. Small bowel adhesions typically present with symptoms of small bowel obstruction.

47. Question

1 points

A 23 year old man presents with a 3-month history of cough with blood-tinged sputum, shortness of breath, and gross hematuria. His temperature is 37.5 C (99.5 F), blood pressure is 158/94 mm Hg, pulse is 87/min, and respirations are 22/min. Examination reveals bilateral crackles at the lung base and mild edema of the palpebrae and feet. A chest x-ray film shows scattered pulmonary infiltrates in a distribution different from that present on a film taken 2 months ago. Examination of the sputum shows hemosiderin-laden macrophages but no microorganisms. Laboratory investigations show modest iron-deficiency anemia and no evidence of ANCA-type antibodies. Urinalysis shows gross hematuria and modest proteinuria. A renal biopsy demonstrates the presence of glomerulonephritis with linear deposition of IgG and complement components along the glomerular basement membrane. Which of the following is the most likely diagnosis?

1. ☐ Churg-Strauss syndrome
2. ☒ Goodpasture syndrome
3. ☐ Idiopathic pulmonary hemosiderosis
4. ☐ Postinfectious glomerulonephritis
5. ☐ Wegener granulomatosis

INCORRECT ❌

The correct answer is 2.

Goodpasture syndrome is an autoimmune disease mediated by autoantibodies against a domain of type IV collagen in the basement membranes of both glomerular and alveolar capillaries. Consequently, the lungs develop hemorrhagic interstitial pneumonia manifesting with hemoptysis, whereas the kidneys develop necrotizing glomerulonephritis leading to nephritic syndrome (responsible for hematuria, pitting edema, and hypertension in this case). Linear deposition of IgG and complement along the basement membrane of the alveolar and glomerular capillaries is the pathognomonic feature. The latter alone is sufficient to support a diagnosis of Goodpasture syndrome. Corticosteroids and immunosuppressants are necessary to treat this serious condition.

(Choice 1) must be considered in the differential diagnosis. This condition is associated with blood and tissue eosinophilia and, frequently, with circulating ANCA, i.e., antineutrophil cytoplasmic antibodies (specifically p-ANCA).

(Choice 3) may appear similar to Goodpasture syndrome in its pulmonary manifestations- hemoptysis and pulmonary infiltrates-but this condition does not involve the kidneys nor is it associated with linear IgG deposition along basement membranes.

(Choice 4) most commonly follows a streptococcal infection and manifests with nephritic syndrome. Pulmonary manifestations are not present. Immunofluorescence of kidney biopsies reveals granular deposition of IgG and complement in the mesangium and glomerular basement membrane.

(Choice 5) enters the differential diagnosis of any condition manifesting with concomitant involvement of lungs and kidneys. It is characterized by a necrotizing granulomatous vasculitis and frequent presence of circulating c-ANCA.

48. Question

1 points

A 67 year old man comes to the physician because of insomnia, irritability, and palpitations for 3 months. He is currently taking amiodarone for cardiac arrhythmias, fluoxetine for depression, and enalapril for hypertension. His blood pressure is 130/70 mm Hg, and his pulse is 90/min and regular. Which of the following is the most appropriate next step?

1. ☒ Measurements of thyroxine and TSH ✓
2. ☐ Administration of propranolol
3. ☐ Referral for psychiatric consultation
4. ☐ Substitution of antidepressant drug
5. ☐ Substitution of antihypertensive drug

INCORRECT ✖

The correct answer is 1.

Insomnia, irritability, and palpitations are nonspecific symptoms that may be caused by a variety of diseases and drugs, but they are frequent manifestations of hyperthyroidism. Furthermore, the fact that the patient takes amiodarone should prompt investigations for hyperthyroidism. Amiodarone causes symptomatic hyperthyroidism in a small percentage of patients (2 to 3%) and asymptomatic elevation of T₃ and T₄ with much greater frequency. Thus, thyroid hormone measurements should be combined with measurement of TSH, which is suppressed in the presence of significant thyroid hyperfunction.

(Choice 2) is effective in relieving symptoms of hyperthyroidism due to abnormal sympathetic activation, namely tachycardia, excessive sweating, anxiety, and tremor. It should be used for temporary relief until hyperthyroidism has resolved, but is not adequate treatment in this case.

(Choice 3) implies that the symptoms are due to an underlying psychiatric etiology, which is a plausible explanation in a patient with history of depression. However, hyperthyroidism should be ruled out first.

(Choice 4) would be justified if the symptoms were due to fluoxetine administration. Treatment with fluoxetine, as well as other serotonin-selective reuptake inhibitors (SSRI), may cause insomnia and nervousness. Again, amiodarone-related hyperthyroidism should be ruled out before attributing the symptoms to the SSRI side effects.

(Choice 5) would not be justified in this case. Enalapril, as any other angiotensin-converting enzyme (ACE) inhibitors, is a remarkably safe drug with few and rare adverse effects. Hypotension is one of these, but the patient in this example has a blood pressure within a fairly normal range.

49. Question

1 points

An unconscious 35 year old man is brought to the emergency department by his wife. She explains that the patient takes phenytoin for chronic epilepsy. An hour ago, the patient had a seizure but did not regain consciousness. Physical examination reveals that his temperature is 38.5 °C (101.3 F), blood pressure is 92/40 mm Hg, pulse is 110/min, and respirations are 20/min. During the examination, the physician observes the sudden onset of tonic-clonic convulsions. Which of the following is the most common precipitating cause of this emergency?

1. ☐ Alcohol withdrawal
2. ☒ Drug noncompliance ✓
3. ☐ Head trauma
4. ☐ Hypoxia
5. ☐ Intracranial infection

6. ☐ Intracranial tumor
7. ☐ Metabolic alterations

INCORRECT ❌

The correct answer is 2.

Status epilepticus is a life threatening emergency that should be treated promptly. It is diagnosed when a generalized convulsive seizure lasts longer than 10 minutes or when a seizure episode is followed by another episode without recovery of consciousness. There are two types of status epilepticus: convulsive and nonconvulsive. The convulsive type is the most dangerous. It can lead to metabolic and cardiovascular disturbances, including hypoxemia, hypoglycemia, hypotension, and hyperthermia, that may cause death or permanent brain damage. About 50% of patients presenting with status epilepticus do not have history of epilepsy. The most frequent precipitating factor in adults with a diagnosis of epilepsy is drug noncompliance.

(Choices 1,3,4,5,6 & 7) Alcohol withdrawal, head trauma, hypoxia, intracranial infection, intracranial tumor, and metabolic alterations are other precipitating factors for status epilepticus. Of these, infection is the most common in childhood.

50. Question

1 points

A 26 year old librarian presents with chronic daytime somnolence, which has frequently caused him to fall asleep at work. He does not smoke but drinks 1 to 2 glasses of wine daily. He says he frequently awakens at night but denies any visual or auditory hallucinations on falling asleep. His height is 186 cm (73 in), and his weight is 60% greater than expected. Chest examination reveals no specific findings other than distant breath sound. Arterial blood gas analysis during normal ventilation shows:

PaO₂: 82 mm Hg

PaCO₂: 55mmHg

After the patient voluntarily hyperventilates for 1 minute, blood gas analysis returns within normal limits. Which of the following will have the greatest benefit on this patient's symptoms?

1. ☐ Benzodiazepines at bedtime
2. ☐ Daily acetazolamide
3. ☐ Morning administration of dextroamphetamine
4. ☐ Supplemental oxygen at night
5. ☒ Weight loss ✔️

INCORRECT ❌

The correct answer is 5.

The clinical picture and results of blood gas analysis before and after hyperventilation are characteristic of obesity-hypoventilation syndrome (also known as pickwickian syndrome, after a character in Charles Dickens' *The Pickwick Papers*). Hypoventilation results from a combination of reduced drive on respiratory centers and physical impediment on respiration imposed by obesity. Improvement of hypoxemia and hypercapnia following voluntary hyperventilation differentiates this condition from chronic obstructive pulmonary disease. Most patients with pickwickian syndrome also have obstructive sleep apnea and consequent daytime sleepiness. Weight loss is the single most effective therapeutic intervention.

(Choice 1) Benzodiazepines at bedtime are contraindicated, as are any other hypnotic agents. Alcohol should also be avoided.

(Choice 2) Treatment with daily acetazolamide has been tried in obstructive sleep apnea but with disappointing results.

(Choice 3) Morning administration of dextroamphetamine is used for the treatment of narcolepsy. This disease is hereditary and manifests with sudden sleep attacks, cataplexy (abrupt loss of muscle tone), and hypnagogic hallucinations. None of these symptoms are present in this case.

(Choice 4) Supplemental oxygen at night has been found to have some benefit in reducing the severity of nocturnal episodes of hypoxemia in obstructive sleep apnea, but it may also increase the duration of apneic episodes.



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